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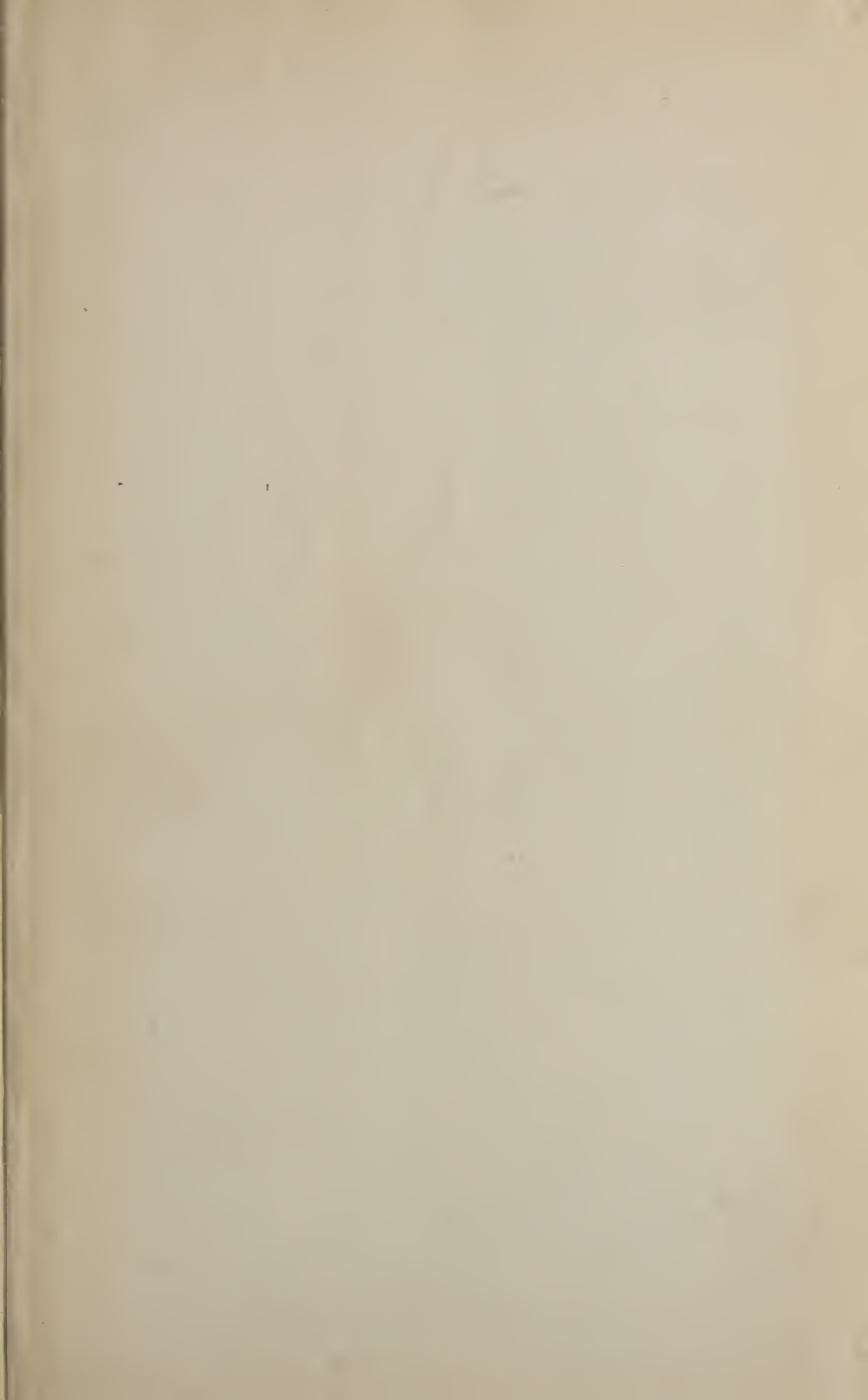
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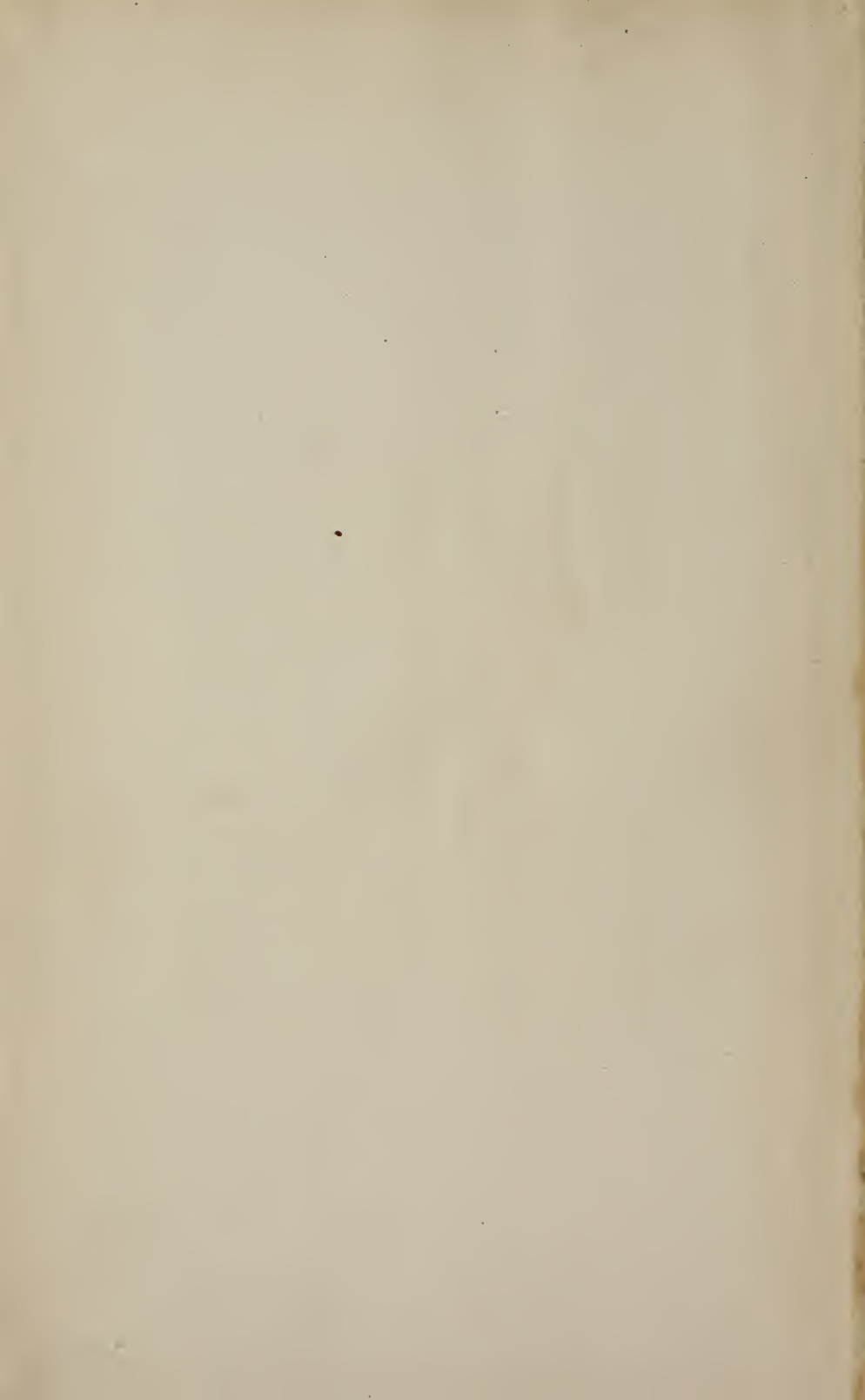
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THE
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EDITED BY
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KENT, OHIO.

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No. 1.

CONTRIBUTIONS.

THE ELECTRICAL FUSION OF PORCELAIN.*

BY L. E. CUSTER, B.S., D.D.S., DAYTON, O.

AT the last meeting of this society I explained the law of electrical heat and demonstrated its use for the fusing of platinum. I have now to explain the application of electrical heat to the fusing of porcelain and its practical application in dental practice. When electricity is conducted by a metal it produces heat according to the resistance of the conductor. When the current leaps across a break in the conductor it meets with so great a resistance as to develop the highest heat. In other words the heat is proportional to the resistance of the conductor, the voltage and quantity being equal. While the arc gives sufficient heat the difficulty of managing it precludes it from use in fusing porcelain. The other form of heat is that produced by electrically heating a wire and we have simply to use a metal for the conductor whose fusing point is above that of porcelain. For this purpose platinum first suggests itself, but the margin between the melting point of high fusing porcelain and platinum itself is so narrow that it is necessary to support the wire while it is so highly heated. It is also important for economy to enclose the heat in a sort of oven.

* Read before the Ohio State Dental Society, December, 1894.

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Since the source of heat is different from that which is the product of combustion I have departed from the old fashioned form of muffle, to a form which I think more in keeping with this new agent. The small muffle for crown and bridge work is made essentially of a plane base upon which rests a removable cup-shaped cover. In the upper part of the cover is a small opening for observing the fusing process. The advantage of this form is that the most delicate crown and band can be placed in position upon the base for fusing without disturbing their arrangement. In most muffles it is necessary to slide the piece in on a tray, during which there is danger of jarring the parts.

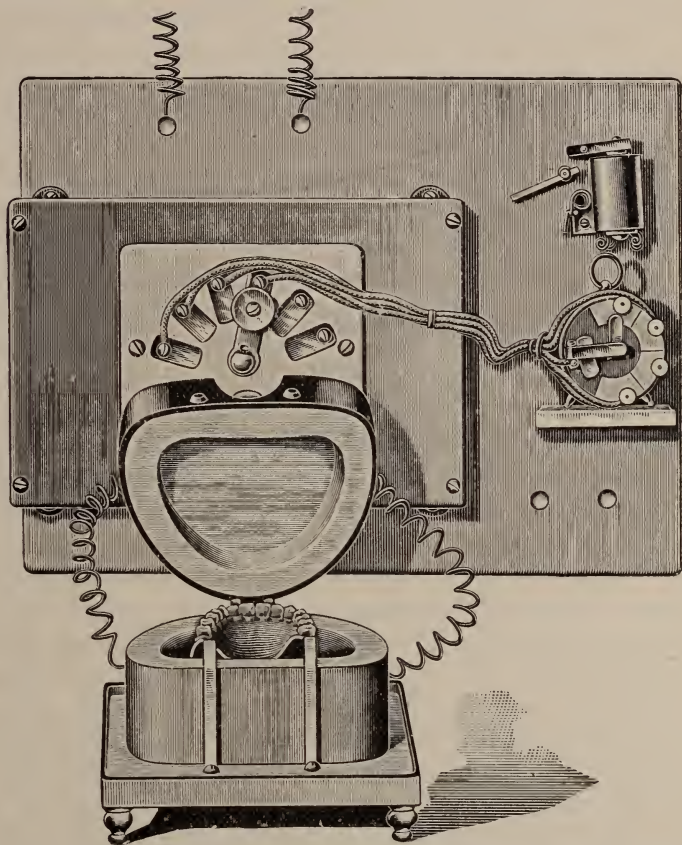
The cover being hinged it is easily guided in to its proper position where the electrical connection with the base is automatically made.

The amount of current for operating the small oven is equal to about a hundred candle lamp. While the 110 volt current furnishes an abundant current for the small oven so that the current passes through the cover and base as a single current, this arrangement will not give sufficient heat for a large muffle. It requires so large an amount of wire that the resistance is too great. This electrical problem governs the form of the oven for a full case. The large open is constructed very much in the form of an ordinary vulcanite flask the upper section being a duplicate of the lower. In the upper section of this also is a small opening for observation. By the new mode of wiring the large oven another advantage is gained, the upper section may be removed and its current broken without cutting off the current from the lower. So that a case can only be dried out as if it were in an open tray, but the heat raised to that point where flaking occurs so that this can be repaired and the baking proceeded with without any interruption. It might be noticed incidentally that the arrangement furnishes as well a most perfect appliance for heating up and soldering cases of all kinds.

The operation of the electric oven is quite simple. It is furnished with a rheostat so that the heat may be as gradually and accurately raised as a vulcanizer; not only that but the heat can be cut off instantly.

If it is desired to raise the heat without the hand lever it may be done absolutely by clock work. Let one wire of the rheostat connect with a lever attached to the minute hand stem

of a clock and place contact plates at such intervals on an insulated dial plate as you may wish the current increased. The last plate is to be placed at that point where it is desired to turn the current off. I find that in spite of varying currents this gives results that are quite accurate.



One inexperienced in porcelain work will find difficulty in telling the exact fusing heat. To meet this I have also devised an automatic cut-off. A plug of fire-clay which fits the hole for observation has running through it two platinum terminals which are connected with a magnet operating a cut off. A button of the same body or gum as that used in the case is laid upon the lower terminal of the plug. When the fusing point is reached and the button melts the upper terminal, by its weight, is allowed to come in contact with the lower whereupon the circuit is closed

and the magnet releases the contact spring at which the current is cut off from the whole instrument.

The time regulator and thermostatic cut-off are not essential to the oven however, in fact it is such a pleasure to operate it that the best practitioners I think will prefer the more certain method of operating it by hand. When an operator has an instrument which instead of confining himself to a hot room and all the disagreeable things connected with it known to you all, when instead he can place upon his operating table and with his finger upon the button and at will produce a clean heat up to the melting point of platinum, a disagreeable task becomes a fascinating pleasure. I have time and again fused a case at the same time I was making a gold filling. While a case may be fused with this appliance in from five to ten minutes starting from a cold muffle, for reasons known to every dentist, it is better to raise the heat gradually. In the time attachment I have fixed the time of fusing at 30 minutes, but this may be changed at pleasure.

Since the case is enclosed and the light is the same from all directions, the glaze cannot be detected as in an old fashioned muffle. But there is another and I think a more accurate method of telling the fusing point. The eye being but a few inches from the piece, it is able to accurately observe the different stages of the fusing. He can see the different molecules as they coalesce. During the first stage the body will appear like snow. As the heat is increased it undergoes contraction, during which time fissures form. The difference in color between the body and the teeth is still well marked. It is due to the loose texture of the unfused body, but after a few moments the white and granular appearance of the body begins to deaden and become like the teeth. The particles are coalescing. If the current be now turned off it will be to a biscuit, but by continuing the heat a little longer till nothing but the outlines of the teeth is distinguishable, the case is fused. The current should be immediately cut off and the stopper inserted. If you have only brought to a "biscuit" the stopper may be left out when the case may be removed in 30 to 40 minutes, but if it is for a full fuse the stopper should be inserted and the case allowed to become perfectly cool, which requires about two hours. If it is desired to cool less rapidly, a glass globe placed over the oven will prolong the time to $3\frac{1}{2}$ hours.

The advantage of the electric oven for porcelain work may be summed up as follows:

The heat is high enough to fuse any porcelain used in dentistry.

The heat being derived from an electrically heated platinum wire, itself a noble metal, invested in an infusible material, is perfectly free from any gas so common with most furnaces.

The ease with which the heat can be controlled with a rheostat.

The perfection with which the heat can be cut off so that there is no danger of over-heating.

Instead of removing the case from the heat, the heat is removed from the case, which prevents a change of position of the teeth as well as checking.

The freedom from noise, dirt and heat of the room as well as the comparatively small cost of operating it.

DISCUSSION.

DR. GRANT MOLYNEAUX: I see I am down to discuss this paper. I can't see that I can discuss it very much, but the method seems to me to be the way we long have sought, something that can be thoroughly controlled and easy of manipulation. It don't seem to me that it makes any difference in the case as to the character of the heat or that the different kinds of heat would make any special difference. The heat from a coke furnace would probably not be different from the heat of this electric furnace up to the point of incandescence. The coke furnace or gas furnace requires an undivided attention during the entire process of firing. The dangers that arise out of what is called gasing, is the discoloration that occurs and gives the continuous gum its dead appearance that is done so frequently with a gas furnace. Our gas generated must necessarily come from the gas generated during the combustion of the gas or coke. This discoloration must be produced before the piece reaches the point of incandescence, and I think in this furnace it would require almost as much time to turn a piece as it would in the coke furnace, that is, after raising the heat to a certain point. In the ordinary coke furnace we must start from the outside of the muffle and the whole inside of the furnace, everything must be incandescent. In making continuous gum work we have our piece ready and set it near the heat to dry out gradually, and as the muffles begin to redden we introduce the work. The dangers are from introducing it into the furnace before it is hot.

The advantage of this furnace are there is no possibility of gas. The heat is so far under control it requires no attention from the dentist. It can get gradually warm, that is, kept up a sufficient time to dry every bit of moisture out of the body and after that moisture is out the heat can be raised as rapidly as possible until the point of fusion is reached.

The entire credit of continuous gum work lies in two points: first, in taking it out at the proper temperature maintain an adaptation of the platinum, and the compensation for the effect the shrinkage would have on the palate; in hard points upon which there was any shrinkage the adaptation must be altered a little bit. This can be done judiciously and without injury to the plate. Aside from this trouble and the trouble of repairing, that is, with the old furnace and the labor connected with making the fire, continuous gum work is a more certain work than any other that we have. It is certainly the highest type of mechanical denture. It is more cleanly and it is durable. The tissues retain their health and the ridge retains its form under a platinum denture longer than any other plate.

With the furnace Dr. Custer has introduced to this society, repairing would be a matter of no consideration whatever. If a plate happened to fall and something broken off it can be easily restored. From the fact that there is no gas about it, there is no danger of free gas attacking the body. There need be no apprehension of that. I think the introduction of this into the laboratory of the dentist will revolutionize that department. It decreases the trouble arising from accidents—if you break a tooth it does not have to go through the big coke furnace when you haven't time for it and don't get paid for it, for you can do it without loss of time. I think it is one of the grandest achievements that has been made in the profession recently, and I think Dr. Custer deserves a great deal of credit for having solved this problem.

Aside from the continuous gum work there are many features that might be spoken of as a recommendation of the furnace; in considering bridge-work and crown, in gold plate, platinum plate and porcelain, which we can do without loss of time.

I have had a good deal of experience with the different kinds of furnaces used. I have not had experience with the recent furnace of Dr. Land's, but the coke furnace in nearly every form, and the gas furnace I have had experience with and I have never seen the same color or strength obtained through gas furnaces or from patent coke furnaces. The color is different. I don't believe there is any difference in the heat up to the point of incandescence.

Porcelain work depends for its strength on the perfect union of every molecule of that body, and the perfect union of that body to the platinum plate.

These pieces are glazed throughout and it requires a considerable amount of strength to break them. Those made by the old process are not solid throughout. The heat seems to be the best heat that you could possibly have, because it is under control. We can raise the temperature as gradually as we like. You can shut off the current and the heat stops and it cools down. I expect great things from this furnace.

DR. FRANK HUNTER, Cincinnati: I have been in the profession for a few years and I consider myself quite a young man, in fact, quite a boy. I have had, in former years, considerable experience in this, and up to the time I practically stopped mechanical dentistry I had my share of experience in it, but seeing what I have seen here and hearing what I have heard, I have come to the conclusion I must be a back number. Dr. Custer is one of those electrical cranks that there is no telling what he is going to do next. If he keeps on at this thing I don't know where he is going to land, but it is perfectly rational. It is certainly the greatest advance I have ever seen.

DR. AMES: Dr. Custer was at my office a couple of months ago and told me what he had, and I would not let him leave town until he came to my office and hitched it up to the electric light and I rubbed his fur down then and there. It is a greater step in advance than anything that has been brought out in a long time, within my time. It accomplished more at one sweep you might say. It applies not only to continuous gum work but to crown-work and bridge-work. We can do more artistic work than we could before. There is no question but this is better than the porcelain and gold work we have been putting into our mouths, and I think great credit is due Dr. Custer for what he has done in this work, and I can say nothing except to commend Dr. Custer's work. The positive freedom from gas is a very great point. All I can say is, I would take off my hat to Dr. Custer as a great man.

DR. C. H. HARROUN, Toledo: I have been in the business since 1858, when I purchased an old muffle from Cincinnati. I have gone through all the processes, spoiling things. I think now the time has come when I can begin again as a boy. I think any man who has made a piece of continuous gum work will say that a good thing has been accomplished. There may be something arrived at that will make it more sure of success, but it seems to me we have come to the point where perfection is very near.

I had the pleasure a number of years ago, as one of the board of examiners of this state, to inquire into the qualifications of a gentleman that came down from Westerville up here. He had a family of children going to school and worked hard trying to support them and give them an education. His name was Custer. I voted to give him a certificate

to practice dentistry. That is a little history of the Custer family. If I am not mistaken this Dr. Custer is one of the boys that was going to school there. His father was a workman in those days—rough and uncouth when he first went to work. He was giving his family an education so they could be something in life, and I am very much pleased with the results coming from that work, and I feel proud that we have got a man in our state capable of bringing this out. Ohio has taken the lead in many things and we have taken the lead in this thing to-day.

DR. H. A. SMITH, Cincinnati: I suppose stories about the Custer family are the order of the day. I was very much amused a few days ago by the estimate of one Custer about the other. I asked, "how is Levitt getting on?" He says, "I don't know that there is much good in him, he has gone daft on electricity. I am afraid he is going to be a failure."

I could tell another story about the Custer family. You know Prof. Wright. He tells the story there, that all our students take their notes in Greek. He boasted of this. One day in his lecture in physiology he left his text book at home and asked Custer, a brother of this Dr. Custer, for his text-book, and he had taken all his notes in Greek. They took all their notes in Greek, showing they are thoroughly educated men.

DR. GEO. FIELD, Detroit: I am glad I came down here. I have done a great deal of that work. I have a furnace that weighs 500 pounds, and I have worked from the time I started out at night until broad day light in the morning. I first began with Dr. Spaulding in 1861 when a patent was obtained for making continuous gum, and Dr. Spaulding wrote Dr. Allen telling him to send the furnace and if he liked it he would buy the patent. I was one of the boys that helped make fires in the furnace. The first work was done in St. Louis in 1862. Since then I have done a great deal of the work and have taken a great deal of interest in it. The labor of making continuous gum work has probably prevented many men from doing it that would otherwise do it. It was putting a good deal of labor and time and money to do this thing and they thought it wouldn't pay them, especially when living in a community where people couldn't afford to pay for their work so much money. I saw this running down from a large furnace weighing 400 pounds gradually getting down to a small furnace until we got the Ambler Tees furnace that we thought a good thing. From that it has gone down to a still smaller thing in the way of a little furnace that works admirably, but when I see this little toy furnace I haven't a word to say. This is beautiful work. You won't see one shop in five hundred that will get it out that way without any cracks in it. You can't do that with the old furnaces we use to-day. There was always more or less

danger of over-fusion, but you don't get as good work as if you bring it to what we call a biscuit heat; so that the bodies will show granules as the dew on the grass in the morning. That seems to be done very beautifully so that this gum can be beautifully put on. I am very glad I came to Ohio.

DR. TAFT: I can conceive a great many purposes for which that can be used in addition to porcelain work. I don't see why it wouldn't be a good furnace for melting gold and making alloys just as well as many kinds of work. Take a little crucible of the proper size and in there you can melt gold. The difficulties many times in melting gold and alloying gold is the foreign substances in the fire that get in the gold and silver which interfere with and mar the results. Nothing of that kind could occur here.

DR. OTTO ARNOLD, Columbus: I don't know anything that could be said just now that would enhance the value of this valuable invention.

Dr. Arnold moved that a committee of three be appointed to procure a suitable medal to be presented to Dr. Custer as a testimonial from the society, of appreciation for the valuable appliances invented by him. The President appointed Drs. O. Arnold, J. Taft and C. R. Butler on this committee.

SOME EXPERIMENTAL TESTS WITH STERILIZING AGENTS.*

BY L. P. BETHEL, D.D.S., M.D., KENT, OHIO.

THE object of these experiments has been to find, if possible, some chemical agent that, for the sterilization of dental instruments, would prove as efficient as boiling water.

A chemical disinfectant always at hand and ready for use would be, in many ways, an advantage.

The agents used in these tests, were electrozone, formalin, kerosene oil, and peroxid of sodium.

The latter was used in two ways: As a saturated solution, made in the manner described by Dr. Van Woert, and by putting a small quantity, about as much as can be placed on a silver dime, into a glass containing infected instruments and filled about one-third full with water. The gases, liberated by the chemical action, acting in their nascent state on the infectious material.

METHOD OF PROCEDURE.—In order to have the tests conform us nearly as possible to actual practice, a number of decayed teeth

* Read before the Ohio State Dental Society, Dec., 1894.

were taken immediately after extraction and placed in a test tube containing sterilized meat bouillon.

The teeth used presented various stages of decay and suppuration of the pulps. Previous to inserting the teeth in the bouillon, however, the decay was well loosened, by means of a sterilized excavator, to insure a distribution of many bacteria in the solution. The contents of the test tube were well mixed and trial cultures made on gelatin and bouillon to determine whether the bacteria, in the solution, would grow on these media.

The result was that the germs developed on gelatin, liquefying it quite rapidly at room temperature, but thrived better in bouillon kept a little below blood temperature in an incubator.

The instruments used for the experiments were a barbed broach, a large bur, and an excavator. These were dipped in the tooth mixture, allowed to dry in air and then immersed in the disinfecting fluid. A stab culture was then made in gelatin tube No. 1, the instrument carried to tube No. 2, and both smear and stab cultures made, then carried to still another tube and this repeated.

Three tubes were used for the reason that enough of the disinfectant might be carried into tube No. 1 to prevent the growth of germs, should any remain alive, as most of the sterilizing agent would remain in this tube after a stab culture had been made, and yet there would still remain some germs on the instrument to be carried to one or both of the other tubes, yet not enough of the disinfectant to prevent growth.

Where bouillon was used two tubes only were employed for the disinfectant would be rinsed off in tube No. 1 and any remaining germs carried to tube No. 2 would not be prevented from multiplying. It is probable that the small amount of disinfecting fluid carried into tube No. 1 would become so diluted with the bouillon that it would have no further action than to somewhat retard the growth, yet, to be certain, a second tube was used.

The time of immersion in the disinfectants was three minutes, except in a few instances, for, to meet the demands of the dentist, an agent should completely sterilize an instrument in a few minutes at the most.

Aside from tooth bacteria the *subtilis bacilli*, containing very resistant spores, and the *staphylococcus pyogenes*, were used in

some of the experiments. Both of these bacteria grow rapidly and being so resistant further tested the value of these chemical agents as sterilizers.

The results of the experiments were as follows:

DISINFECTANT.	CULTURE MEDIA.	CULTURE.	Time of exposure, minutes.	Number of Cultures.	Sterile.	Non-sterile.
Formalin	Gelatin	Tooth bacteria	3	3	3	
do	Bouillon	do	3	6	6	
do	do	Subtilis	3	2	2	
do	Gelatin	Staph. pyogenes	3	6	4	2
do (washing infected inst. before sterilizing.)	do	Suppurating pulp	3	2	2	
Electrozone	Gelatin	Tooth bacteria	3	3	3	
do	Bouillon	do	3	6	4	2
do	do	do	1	1	1	1
do	Gelatin	Subtilis	3	3	3	
do	Bouillon	do	3	4	4	
do	Gelatin	Staph. pyogenes	3	5	3	2
do	do	do	5	3	3	
do	Bouillon	do	3	2	2	
do (washing infected inst. before sterilizing.)	Gelatin	Suppurating pulp	3	2	2	
Sodium peroxid (saturated solution.)	Gelatin	Tooth bacteria	3	6	6	
do	Bouillon	do	3	2		2
do	Gelatin	Staph. pyogenes	3	6	6	
do	Bouillon	do	3	2		2
do (washing infected inst. before sterilizing.)	Gelatin	Suppurating pulp	3	2	2	
Sodium peroxid placed in water containing inst.	Bouillon	Tooth bacteria	3	2		2
do	Gelatin	Staph. pyogenes	3	2	2	
Kerosene	Gelatin	Tooth bacteria	3	6		6
do (washing infected inst. before sterilizing.)	do	Suppurating pulp	3	2	2	

It will be observed that in the use of kerosene in six cultures all were non-sterile, while in two other tests with this agent, precaution being taken to wash the infected instrument in hot water before immersing in kerosene, both cultures remained sterile.

This suggests the advantage derived from the thorough washing of infected instruments prior to immersing in the disinfecting fluid, for it takes away the accumulated mass of infectious material so that those bacteria remaining are more separated and therefore more readily acted upon by the sterilizing agent.

In two of the tests with formalin, and two with electrozone where staphylococcus pyogenes was used, the non-sterility was due, doubtless, to having taken the bacteria directly from potato

culture where the growth was abundant and the amount taken so massed that the disinfectants could not penetrate to all the germs in the short time of exposure allowed.

From these tests it will be seen that formalin, electrozone, and sodium peroxid all have a high disinfecting power and may be employed with advantage in dentistry for other purposes than the sterilizing of instruments.

You are probably all familiar with peroxid of sodium from what Dr. E. C. Kirk and others have written about its use in dentistry as a tooth bleacher, pulp canal cleanser, etc.

The attention of the dental profession was called to the use of formalin in dentistry by Dr. J. S. Cassidy, in an article on Formaldehyd in the October issue of THE OHIO DENTAL JOURNAL. The characteristics and action of formalin are fully described in this contribution and it will bear careful perusal. Dr. Cassidy has found much satisfaction in the use of this drug in the treatment of pulpless teeth, etc.

Formalin is acid in reaction, but only a very slight coagulator of egg albumen. Its odor, while not unpleasant, is somewhat irritating to the membranes of the nose and throat.

Dr. C. F. W. Bödecker has called attention to the use of electrozone, in an article published in the October number of *The Dental Practitioner and Advertiser*. He highly recommends it for the treatment of pulpless teeth, pyorrhea alveolaris, as a mouth wash, etc.

It is neutral in reaction, a non-coagulator of albumen, and has marked bleaching qualities. It has a chlorin odor but instruments immersed for days in the liquid show but slight action of the drug.

Electrozone is prepared by treating sea water with electricity. It contains $3\frac{1}{2}\%$ of chlorids, sodium, potassium, magnesium, calcium in solution, and iodine and bromine. Sea water being an unknown quantity the preparation may contain some other ingredients. It is non-poisonous and may be used internally as well as externally. When not in use it should be kept well corked and in a cool place. Its efficacy as a disinfectant, its wide range of use and cheapness of the preparation, 50 cents per quart bottle, make it a valuable addition to the list of useful dental medicines.

DISCUSSION.

DR. H. A. SMITH, Cincinnati: I think it must be very gratifying to all of us to have a paper like this presented to a body such as we are members of. Knowledge first hand I think is very scarce with us. I feel like bowing very low indeed to a man like this who will make original investigations in this direction, that are interesting and exceedingly valuable. The one thing that concerns us most in the practice of dentistry to-day is the need of an efficient, rapid method of sterilization. Do we ever think how difficult it is to produce cleanliness? It is almost impossible to obtain surgical cleanliness. When we have washed our hands thoroughly and applied the rubber dam, in the act the fingers have come in contact with parts of the mouth, and they are no longer clean. The moment you take up the sterilized cotton with the fingers that have come in contact with the mouth, you have infected the cotton and putting it in the tooth you infect that tooth. There is nothing about the dental office perhaps, that has not organisms.

Only as we are clean do we succeed as dentists. The crying need is a sterilizing agent that will sterilize instruments quickly. The dentist is a busy practitioner and can't afford to wait for anything. Three minutes is a long enough time and it should not exceed ten minutes to produce perfect sterilization; I don't mean the cleanliness that stands next to Godliness. We have some experiments in this direction, notably of Dr. Miller where he has formulated a method for us. I believe he experimented some time in sterilizing remains of devitalized pulps in root canals. In treating the remains of pulp tissue with a disinfectant, we make a filling and it would take six months or a year to know whether it was a success or not. I would not like to make such experiments without knowing whether it was going to be successful.

Here we have something tangible. Think of the cases that could be treated for the poor if we had an agent of this sort. Nothing consumes so much time as the treatment of root canals. Don't you feel like bowing low to a man who will make these experiments for us—original research.

I am not competent to discuss the paper thoroughly. I think those three agents he discusses command our attention, and we should test them, making a note of each case we try.

DR. J. R. CALLAHAN, Cincinnati: I have been on the floor so often that I am ashamed of myself. I am greatly pleased with the paper and also obliged for the work Dr. Bethel has done, and when the paper appears in print I shall study it closely.

DR. C. R. BUTLER, Cleveland: I am something like Dr. Smith; I certainly will bow to the compliment that has been paid us here this

morning by Dr. Bethel. He has gone into this thing to a considerable extent and it is of an original character and we congratulate ourselves as a society on such kind of work that has been done by one of its members. I could say considerable in a general way, but it has been presented in such a nice manner that we will all be profited by it. The paper ought to be published largely in the state and we ought to be able to apply it in every-day practice, for when the sterilization of our instruments can be done so rapidly, the necessity of it we can see more and more.

DR. W. B. AMES, Chicago: Asked Dr. Bethel, the degree of heat that is required to thoroughly sterilize instruments.

DR. L. P. BETHEL, Kent: That depends largely upon the bacteria with which the instrument is infected. There are some bacteria that are very resistant and some that are not so much so. In the mouth we find almost everything at times, though perhaps not constantly. The bacteria are taken in with the breath from the air, dust, etc. In that way we find many kinds of bacteria in the mouth not normally there and it is hard to tell the exact degree of heat that would destroy all of them, but a temperature 300° to 500° F. would probably do so.

DR. AMES: Do you not find that disinfecting agents are more potent when they are warm?

DR. BETHEL: Yes sir.

DR. W. B. AMES, Chicago: I have thought a little and experimented on the subject, but not in the way Dr. Bethel has. I have a sterilizing agent that I have employed to some extent and that is glycerine heated to about 300° F. An apparatus can be made by taking a porcelain dish of some sort and placing in it the glycerine and into this a tall glass beaker containing water. As the glycerine is heated to the point that will cause water to boil, the glycerine will be found to be very much hotter, will have almost reached the boiling point yet will have no disagreeable odor, as the boiling water keeps down the temperature of the glycerine. I have immersed the instruments in this glycerine and about 300° will thoroughly sterilize them.

I have done considerable sterilizing in root canals of putrescent pulp tissue which has been only partially removed, it being impossible to thoroughly remove all. The fact of iodine being as potent as it is, it being a germicide and undisputed deodorant, the efficacy of oil of cassia and the fact of iodine being soluble in oil of cassia, led me to make my experiments with them and I find that the solution of iodine and oil of cassia seems to have certain peculiarities. The hydro-carbon combinations give various compounds, and I believe from what I have seen from making a solution of iodine in oil of cassia a new compound is formed to

which your attention has never been called. You can dissolve two grains of iodine in a dram of oil of cassia and get a syrupy solution. Use more than two grains of iodine and in a few days you will have a hard mass. If you use five grains or ten grains you will have a mass like so much anthracite coal, insoluble, and that fact leads me to believe a thoroughly new compound has been formed. From six or eight minutes use of this, I have obtained results in the disinfection of canals that would lead me to think it is the most efficient combination I have used for that purpose. It is very convenient to use, as you can use any kind of point. I want to speak of its being soluble and yet so slightly soluble in water that we can place it in the root and leave it for a long time without being dissolved.

DR. C. R. BUTLER, Cleveland: I am glad Dr. Ames has spoken of his experiment. A certain amount of iodine to a dram gives this undesirable mixture. I have been using it and experimenting with it and flattered myself it was doing good work, as Dr. Ames has said, and he has been working in the same direction. I am not particular about the small quantity of the iodine, but I don't carry it to the soluble point.

DR. HENRY BARNES, Cleveland: I have found the same results from the use of iodine and oil of cassia. It resulted in this solid mass, but I have not found that it deteriorated in that condition. I have used it in children's teeth.

So far as Dr. Bethel's paper is concerned, I want to voice what the others say in regard to it. If there was no other paper before this society, if we could go home and take the thoughts brought out in this, and use them, it would more than pay us for the trouble and time expended here.

DR. F. E. BATTERSHELL: I was very much pleased with the Doctor's paper. I suppose none of us could have an adequate idea of the pains-taking and care of these researches. I think that these contributions are of great benefit. We cannot all of us experiment in every line, and when they are laid before us in that way they are very valuable.

We sterilize the point or ball of an instrument and then we handle the instrument and transfer our hands from the mouth to the instrument, which in handling becomes more or less contaminated, but we only disinfect a portion of this. By making a box in which we could lay our instruments and having them constantly at a heat that will sterilize, we will completely obliterate all germs that are deposited on instruments and then we have an ideal sterilizer. Wouldn't it be well to lay these things in the sweat boxes and our clothing, our coat, because we are not only responsible for what we put into the mouth but we are responsible

for what we place in close contact with patients. If we have been operating upon a patient who may have disease germs about the clothing and we transfer ourselves to another person who, being very susceptible to the disease, may become infected by a transportation of the disease germs, we can avoid the infection by taking the outer robe or coat and placing it in a sweat box and sterilize it before going to the other patient. Wouldn't it be a good thing?

DR. —: Would't it be a good idea to put the patient in that sweat box?

DR. G. E. HUNT, Indianapolis: I consider this one of the most valuable papers on the subject that has ever been presented. The experiments show the greatest care and the results arrived at are very important. The subject of sterilizing our instruments should receive a great deal of attention. The results that Dr. Bethel has reached are results that should be retained in the practice of all of us. There is no doubt heat is the best sterilizing instrument we have. If we heat anything hot enough it will kill all the bacteria in it. It will be impracticable to heat everything, and many bacteria even half an hour's steaming will not kill. We don't want to spare the instrument for half an hour or twenty minutes even. In heating it we should have to have such cumbersome apparatus it is a nuisance and if we could get away from it we would be better off. The ideal sterilizer will be something in the line the Doctor has been experimenting in that will thoroughly sterilize in a short time.

Electrozone promises great things. I think it was first used to sterilize a large mass of putrid matter in Ricker's Island Extension, East River, N. Y. The place had been used for a dumping ground for all Manhattan. After a long time it was discovered that the hot sun made it a mass of corruption and the wind blew it over New York City. Somebody conceived the idea of making electrozone out of sea water and then sterilizing this putrid mass with the electrozone.

From the experiments that have been made I would judge that formalin was also a formidable drug.

I think that this matter of sterilizing can be carried farther than is necessary. The gentleman who preceded me spoke about sterilizing our coats. I don't think that is necessary. We may come to it after a while. We are in danger of carrying certain lines of practice to excess. To sterilize the napkin after it comes from the wash may be necessary, but I don't believe it. I believe a napkin, after it has been washed, is sterilized enough for common use. It is different from instruments. They are put into the human mouth and they require sterilizing.

DR. J. TAFT, Cincinnati: As heat is conceded by all to be the best sterilizing agent, the only question being to make it practicable, it seems

to me, that Dr. Custer might make some arrangement for sterilizing by electrical heat that will be practicable and better, I think, than anything else.

DR. C. H. HARROUN, Toledo: I would like to suggest in regard to the napkins, if Dr. Hunt would go into a laundry and notice the way in which our napkins are washed, he would think it was necessary to sterilize them. The Chinaman takes a pail of water, takes some in his mouth and squirts it out onto the napkins before ironing, and then what have you got?

DR. HUNT. I have my washing done at home and I know what I get.

DR. BETHEL: I appreciate the remarks that have been made and thank the speakers for them. In regard to these experiments I wish to say a few words. They were made under the most unfavorable circumstances. The instruments were infected and the infectious material was left on them; they were not washed before putting in the sterilizing fluid. The cultures were placed in bouillon instead of sterilized water. When placed in sterilized water the growth is hindered and the bacteria are less resistant. For example, take anthrax bacilli and the spores are so much more resistant in bouillon than sterilized water that it requires twenty times as much bichlorid of mercury to destroy them as when used in sterilized water.

This was done to possibly offset the resistance of the bacteria as they are found in their natural habitat, and where they feed upon natural food. They are more resistant there than when cultivated on any artificial media. I have little doubt but that had the instruments been thoroughly washed that we would have found them to have been sterilized with three minutes exposure.

I am glad to hear of Dr. Ames' solution. The only objection I would raise to the use of oil as a sterilizing agent would be that the instrument or surface should be thoroughly dried before using the disinfectant fluid, because oil and water are incompatible. If there was much moisture present it would not permit it to be as effectually acted upon, as it would if the water was gotten rid of.

In regard to the electrical apparatus, it would undoubtedly be one of the finest, but unfortunately all dentists do not have the advantages of the electric current, particularly in the small towns, and it would not be practical there, unless however, it could be used with a storage battery or something of that sort. Yet these are, in themselves, hard to keep in order.

In regard to wiping the instruments after sterilizing, I have been in the habit of using cottonoid instead of napkins. I think there can be

no germs in cottonoid to do any harm, as it must be thoroughly sterilized when made, and then there would be no nourishment left in the cotton, to make the growth effectual, because all the oils and fats have been taken out of it. Perhaps a better way to dry instruments would be by hot air.

WATT'S METAL DENTURE.

BY D. A. ALLEN, D.D.S., TOLEDO, OHIO.

THE making of an artificial substitute of fusible alloy, is an extremely simple, as well as useful method of constructing a denture of moderate cost, and combines usefulness, cleanliness and all of the other advantages of metal over the vegetable bases, now used in the construction of artificial substitutes.

Of the various alloys in use, none are so good as the one made after the formula of the late Prof. Geo. Watt, whose extensive experience in chemistry and metallurgy, combined with abundant leisure enabled him to place at the disposal of the pro-

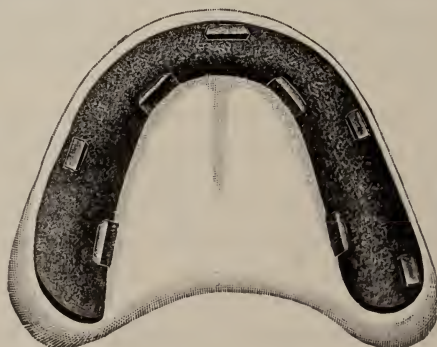


Fig. 1.

fession an article, which after ten years of wear in the mouth, shows no change either in color or structure.

The method of constructing a case is the same as for any of the fusible alloys; or as follows: After securing the impression in the usual manner, give it a thin coat of shellac, then a thin coat of sandarac varnish; after the varnish is dry, soak in water and pour model without oiling impression, using a mixture of two parts plaster and one part Spanish whiting, or a mixture of two parts of plaster and one of finely ground asbestos.

The plate may be cast directly onto the teeth, or the base

plate may be cast and the teeth attached in the usual manner of making rubber attachments.

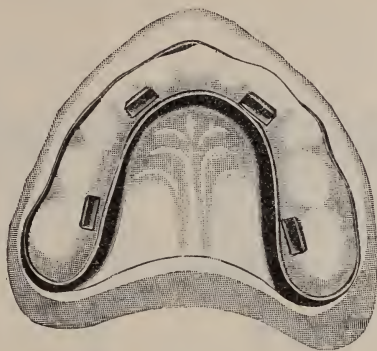


Fig. 2.

Teeth intended for rubber are most suitable for this work. If gum sections are used, grind square joints and slip a strip of writing paper into each joint while waxing up, removing just before flasking.

If simply a base plate is to be cast, a piece of ordinary base plate wax is carefully moulded over the model and trimmed to the gum line and dove-tailed lugs added to secure the rubber (see Fig. 1). A rim with an undercut edge, may also be added if desired, (see Fig. 2 and 3). If for upper case, the base plate should be of much thinner wax, (see Fig. 2).

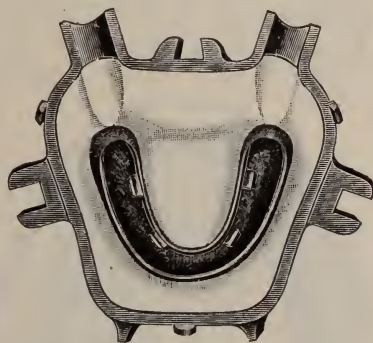


Fig. 3.

If the case is to be cast directly onto the teeth, set them up as an ordinary case for rubber, using care to make the base plate smooth and just as you want the plate to be when finished. This will save much time in finishing. Invest the case in the half of

the flask having the guide pins, leaving only the base plate or base plate and teeth exposed. (See Fig. 3.)

For the investment, use plaster three parts, and pulverized pumice stone one part. After hardening, trim carefully, and cut



Fig. 4.

a groove from each heel to the pouring gages, dust the surface with powdered soapstone, then add other half of flask, and bolt; place pledgets of cotton in the pouring gages and fill, being careful to avoid air bubbles.

When the investment has hardened, warm slightly, not enough to melt the wax, separate and carefully remove the wax. Cut grooves at heel corresponding with grooves in lower half, indicated by projections made by lower grooves, (see Fig. 4.)

Place flask together and carefully dry in oven or otherwise until moisture will not condense on a cold mirror placed over the vents.



Fig. 5.

While the flask is still warm, melt an ingot of the metal in the ladle without stirring or shaking it. Do not heat the metal very hot. Simply watch the ingot until it is entirely melted and pour in a gentle steady stream, stopping the instant it appears in

the other opening. Do not jar or handle the flask until it has cooled, and use the melting ladle for nothing else.

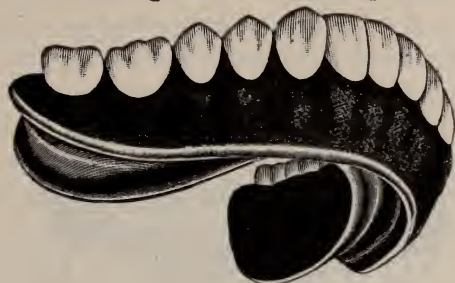


Fig. 6.

It is a good plan to pack moulding sand around the flask, or lute the joint with moistened kaolin just before pouring to prevent the possibility of the metal escaping between the two parts of the flask.



Fig. 7.

When nearly cold place the flask in warm water for a few minutes and remove the plate from the investment, cut off the surplus metal with a fine saw and finish in the usual manner. Fig. 5 illustrates a lower case ready for mounting teeth, and

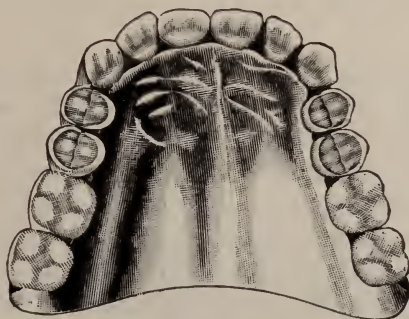


Fig. 8.

shows the manner of roughening the plate so the rubber will attach itself more firmly. Fig. 6 illustrates a finished case and

Fig. 7 a finished case with rim. Figs. 8 and 9 finished cases cast onto gum sections.

To repair, cut away metal enough to let the new tooth or block go in place, touch the margins with chlorid of zinc, invest

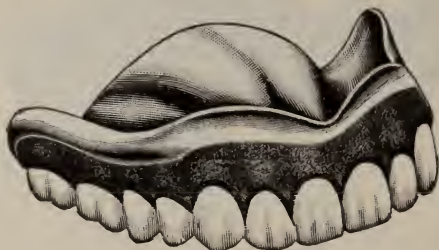


Fig. 9.

as for a new piece, and pour. When the break is very slight, some mend with a blowpipe using beeswax as a flux, with the metal as a solder, or, make an undercut in the region of the pins, fill with rubber, warm the tooth or block, press to place and vulcanize. It may also be repaired with a small soldering iron using wax for a flux and Watt's metal for the solder. In repairing, the metal should be made hotter than for casting a new case.

Most beautiful upper or lower plates may be made by combining it with rubber or celluloid, when there would be too much weight in using the metal alone.

SOME THOUGHTS ON THE TEACHING OF HISTOLOGY AND ANATOMY IN DENTAL COLLEGES.

BY C. M. WRIGHT, CINCINNATI, O.

"SOME THOUGHTS" on a subject, does not imply that the writer is offering *opinions*. Thoughts may be but the shimmering vaporings of scintillating nerve cells reflexly stimulated by a commingling of present and past impressions. The present, or near sensation may arise from a bit of Roquefort at a late dinner—a *café noir*,—or, a lack of the usual slumber-inviting night cap—and this, mixed up with stale impressions on some old memory cells, may incite imaginations or fancies, and we call these *thoughts*. Of this character are "Some thoughts on the Teaching of Histology and Anatomy in Dental Colleges."

Let us then, *fancy* that knoweldge can be divided into two

classes: 1st. A knowledge of *facts*. 2d. A knowledge of theories (or philosophical explanations of facts—or phenomena). Patient investigators have often been fact hunters, and have contributed largely to the first division of knowledge. Logically educated scientists have explained philosophically these facts, gathered by the other workers, without ever having themselves observed a single phenomenon, and have contributed largely to our second division of knowledge. Facts sufficient to establish a theory; or facts and theories are necessary to complete knowledge.

The study of anatomy in the dissecting room, and of histology in a laboratory, has for its objects two things. One is to let the student *see* the structure and structures of the human body macroscopically and microscopically. The other is to train the student in the manual art of cutting up bodies and tissues, so that they *may be seen to the best advantage*. The general surgeon also, begins the manual training of his art at the dissecting table. The dentist on the other hand begins his special manipulative training in the mechanical and operative *infirmaries* of the college.

Just here, the fancy becomes vivid, and we exclaim—What is the use to the dental student, of his course in practical dissections with the scalpel or with the microtome?

Can he not acquire morphology—all the facts that he needs, from *seeing* the dissections made, by a skillful and competent prosector or teacher? Then the qualities of textures or tissue, the minute structures are certainly much more distinctly visible in finely prepared and well mounted specimens made by experts in this art, than in the crude cuttings of the students, in a two months course.

The writer spent some time in watching the method of a queer old teacher of medicine, some thirty years ago. His class in anatomy, consisting of twelve or thirteen disciples—men and women, sat around the “subject,” with text books and diagrams in their hands, following intently the old professor, who skilfully dissected the body; explaining, lecturing and answering pertinent questions. He called the attention of the class to facts displayed by his knives and forceps, and at the same time gave philosophical explanations of the same. It was intensely interesting to the class. Three or four “subjects” dissected in this way before the class was all the “*practical anatomy*” taught in his college.

The writer having studied dentistry, wondered if these students did not get more general and particular knowledge from this more Socratic method, than he himself had, by his careful dissections of the leg of a man, the arm and chest of a woman, and the foot of a negro baby. The writer as a practitioner of dentistry has been trying for thirty years to *apply* this special knowledge gained in the dissecting room to his special art dentistry. One of the colleges in the Association of Dental Faculties is said to have no "*dissecting*," and yet teaches anatomy, and all the other colleges which have dissecting rooms and can get subjects, shrug their shoulders at the inferior (?) method of teaching anatomy. Just now the histological laboratory is the fashion in medical and dental schools, and students gather about fragments of already stained, and softened, or hardened, and imbedded tissues, and cut them into thin slices, or if they have been already cut, simply mount them on their own slides and cover them. They learn to handle bits of tissue with needles, and to put cover glasses over Canada balsam, and to paint around the edges with some protecting varnish. This is skilfully done by some students a five or six weeks course. Just here again Fancy asks, "Would it not be as well for these students to be set down to microscopes with already mounted specimens, and with their text books, and the descriptions and explanations of the teacher, learn to *see* all that can be seen of these tissues, with various powers, low and high—these tissues prepared by those who have made a specialty of this difficult art? The time so spent by dental students would be in a line with their future work. It would be a training of the eye, a training in the art of illuminating and seeing minute objects. The technique of the laboratory for the preparation of tissues for observation can only be acquired as any other art is acquired, by tedious, practice and a few weeks spent in tinkering at a high art will not advance a student in that art. Must a man get a chisel and a mallet and chip at a block of marble for a few weeks in order that he may cultivate his taste and knowledge of sculpture? Must a man grind up paint with a pestle and mortar to become a connoisseur in of paintings? And, must a student cut up sections of bone, cartilage, muscle and nerve, for two months, to be an histologist? Is not the way suggested, the better one? The writer does not wish to imitate Bob Ingersoll—as an iconoclast—without offering another idol to take the place of the broken ones.

NOTE.—If this paper is deemed worthy of discussion by the members of the Ohio State Dental Society, I hope sincerely that I shall not be suspected of depreciating in the least degree the importance to us of these studies in morphology. I deem them of the utmost *use* in medical science, and the art of the dentist is but a one-sided affair, if not built up on the solid foundation of *medical science*. Physiology and pathology are as important to the dentist as to the general practitioner or any special practitioner of medicine or surgery. And these sciences are so intimately allied to morphology (or anatomy and histology) that a separation would be impossible.

SOME THOUGHTS ON THE VULCANIZING OF RUBBER PLATES.*

BY DR. GEO. B. SNOW, BUFFALO, N. Y.

DR. GEO. B. SNOW, of Buffalo, N. Y., presented some samples of vulcanized rubber, and showed what the physical changes are that take place in that material during the process of vulcanization. The samples, both by their change in shape and by their increased specific gravity, showed that their mass was perceptibly smaller after vulcanization, the change differing according to their composition; those composed of pure rubber and sulfur shrinking more than those containing a large percentage of foreign matter; the scale running from pure black to pink, the latter showing the least change. The difference in the specific gravity of the samples showed the change by vulcanization to run from about 6 per cent. for pure black rubber to about 3 per cent. for pink. Attention was drawn to the fact that heretofore unaccountable mishaps which occur in vulcanizing, such as loose teeth, vacant spaces under the shoulders of bicuspid and molars, and under section teeth, are easily explained when the shrinkage of the rubber is taken into account; their occurrence being much more frequent in the use of black or pure rubber than the colored ones.

Better results will be attained if a longer time than one hour be given to vulcanizing. A plate much tougher will be had if it is allowed to remain in the vulcanizer two hours instead of one,

*A Talk given at the Michigan Dental Association, 1894.

the temperature being proportionately lowered. It must be remembered that the 320 degrees of the mercury bath thermometer indicate about 340 degrees for the flask and its contents, and that it is utterly impossible to vulcanize rubber so as to be satisfactory for dental purposes at 320 degrees actual temperature in much less than two and a half hours. Very thick pieces especially if of pure rubber and sulfur, will require even a lower heat and longer time than this to prevent them from becoming spongy in the center.

The subject of the expansion of rubber by heat was then taken up, and specimens were exhibited which showed that its expansion from 212 to 320 degrees is fully equal to its shrinkage in vulcanizing; the deduction following that if the flask was properly packed, and closed in hot water, it would contain rubber enough to make a sound plate if none of it were allowed to escape. As gate-ways are usually cut, a constant escape of rubber is going on while the vulcanizer is reaching the vulcanizing point, with the result that if there is no change in it by vulcanizing there must still be a deficiency in the mold when it cooled to the amount of the escape into the gate-ways. Gateways are now cut for the reception of surplus rubber by removing the entire parting face, excepting a narrow margin surrounding the mold. This, he says, I insist, should never be cut into, it being one of the vital points in doing good vulcanizing that the rubber in the mold must be absolutely imprisoned, having no opportunity for escape when the flask is fully closed. The removal of the surface, as described is imperative, for if it is left, the escaping rubber will be squeezed into a thin sheet, which will resist and render impossible the perfect closure of the flask. I do not think of any circumstances under which I would leave any of the parting surface, excepting the narrow margin I mention, nor do I know of any in which I would cut passages through it, excepting where the flask were to be closed, and rigidly held closed by bolts or clamps, either of which is an abomination.

To give the rubber a smoother surface, and to prevent the adhesion of the rubber to it, the surface of the mold, or at all events that the flask should be held under an elastic pressure, by the use of the spring clamps or by bolts having springs upon them, so that as the rubber in the mold expands by heat, the flask will yield to the pressure and will follow up the rubber as

it shrinks in vulcanizing and thus make a steady pressure on it.

Two plates were shown, which were vulcanized in the College Laboratory at Ann Arbor, one in the ordinary way, and the other according to the process described. The two plates were counterparts, being made upon duplicate models, with section teeth set at a considerable distance from the alveolar ridge and mounted in black rubber. When vulcanized, a bicuspid block was broken from each in order to show the difference between them. The one vulcanized in the ordinary way had a space under the teeth, so that a Swiss saw could be passed under all of them, even to the molars on the opposite side and the pins of the broken bicuspid block were perceptibly loose in the rubber. The other plate showed the rubber to be in perfect contact with the teeth and the pins to be held firmly.

The changes in the plate after vulcanizing, by the contraction of the rubber in cooling were then noticed: Supposing it to be a full set with section teeth, he advised the use of a jack-screw to be placed across it at the rear. If this is done, it will be found to be quite closely held when the plate is vulcanized, on account of the contraction of the rubber in cooling, and its action in conjunction with the arch of porcelain formed by the teeth; porcelain having but little expansion under the application of heat, while rubber exhibits the greatest amount of it of any solid body. The amount of change may be measured with a fair degree of accuracy by observing how far the screw can be turned before it becomes slack, and the contraction can be practically overcome by spreading the plate to the same amount by turning the screw, bedding the plate in something to prevent accidental warping, as, for instance, a flask full of powdered soapstone, and subjecting it to heat enough to soften it. This may not be much higher than 212 degrees. It is not necessary to bring it to, or near the vulcanizing point, though the vulcanizer affords a convenient means of heating it.

The plate is then filed into the proper shape, and its surface scraped, sand-papered, and polished.

SEPARATORS.*

BY HENRY BARNES, D.D.S., CLEVELAND, O.

NATURE in her infinite wisdom, has so shaped and moulded the teeth, as to best serve the purpose for which they were intended. Commencing with the cuspids and including the molars, a solid phalanx is presented, which is well calculated to stand the strain of violent mastication, while preserving to each tooth an individual motion, we have, as a general shape, a convex distal surface and a flattened, or concave and convex mesial surface.

The ideal filling, as to form, has been and is, the aim of the conscientious operator. The methods employed have been varied; the materials used have been many; but whatever the method employed or material used, all have agreed that, to restore Nature's contour, sufficient space must be had to enable the work to be carried on without hindrance and also to afford space for final finishing.

We shall confine our discussion of this subject to the methods in use during the last twenty-five years, and, whatever condemnation we may find, it is not of that which is past, but is confined to the practice of the past, made obsolete by the better of the present.

Previous to the use of cohesive gold and the rubber-dam, the Arthur method was much used. It consisted of grinding or filing the proximate surfaces and leaving V-shaped spaces with a shoulder at the cervix. So unscientific was this procedure that when cohesive gold came into use, it was speedily abandoned. Next came the wedge of wood, which served a long and cruel apprenticeship, we say cruel, because as used by many of the best operators, it was merciless, often driven far below the gingiva, it entirely obliterated the gum septum and furnished a nucleus for many chronic diseases. The objections urged against the wooden wedge may also be urged against the rubber, when used as a wedge. Many teeth were operated upon while yet inflamed from the pressure of the rubber, and the nervous condition of the patient under such treatment, was such as to preclude the doing of good work. That many good operations were performed, is

* Read before the Ohio State Dental Society, December, 1894.

not denied, but that more failures were not noted, is the wonder.

Cotton as a separator was then introduced and while not open to the same objection as wood or rubber, is still quite objectionable on the ground of destroying gum tissue, which should be preserved if the best results are expected.

Dr. Bonwill has explained his method of separating by the use of gutta-percha, by preparing all the cavities in the mouth and then filling from tooth to tooth with gutta-percha and the same left for a number of months. This method may answer in a few cases, but when urged as a practice, is open to serious objections. We must not forget that all practitioners have not the full control of patients as has Dr. Bonwill, so that, while the practice in his hands may produce good results, and no doubt does, it might prove disastrous if generally practiced.

A new thought has crystallized and we have what are known as the mechanical separators, invented by Perry and others. We are quite well aware that they are not perfect, but they are far in advance of anything hitherto produced when considered in the light of results. In this light we propose to discuss them.



- A—Old method of wedging.
Wedge below the gingiva.
B—Position of lugs of Perry separator.
C—Gutta-percha under the bows and resting on occlusal surfaces which prevents rocking.

Many there are who can see no good in them, but we shall try, as best we may, to bring out their good points and endeavor to promote their use among this class of dentists. The objection usually raised, is that the lugs, or teeth, so press upon the tooth tissue as to mar or check it. This is the strongest objection yet raised and is worthy of consideration.

No instrument will work itself. There must be a controlling mind behind it, and if we expect it to fit equally well any and all cases, we shall find ourselves mistaken. All teeth are not made in the same mold, for we have them long, short, broad and narrow and of complex form. This being true, it must needs follow that no instrument, however well devised, can be considered universal in use. We must therefore resort to expedients and may use any one or a combination of methods in any given case. For example: The Perry separator may be used to obtain immediate space, but the teeth being of such shape as to cause the

separator to be dislodged during the operation of filling, may necessitate the use of a peg of wood to maintain the separation after the removal of the mechanical separator, or, the teeth having been separated by the use of cotton, the mechanical separator may be applied to preserve space and to distribute the force of the mallet blow during the operation. The models here presented will explain the uses of the Perry separator which has given the best results in our hands.

As previously stated, all teeth are not of the same size or shape, so that the lugs of a separator would encroach upon the gingiva more in the case of a short crowned tooth than in that of a longer. This difficulty is obviated by the use of gutta-percha or modelling compound, placed on the occlusal surface of the teeth, underneath the bow of the separator and extending to it, more or less material being used as demanded by the case. This serves a double purpose; it prevents the separator impinging upon the gum and also steadies it in position, thus removing the objection previously raised, in that it prevents rocking, which is the prime cause of the checking of enamel. Some cases prevent in which a tooth, mesial or distal to the ones operated upon, has been lost, if gutta-percha is placed in this space, much of the pain will be avoided.

We find the lugs of the separator too thick at their ends and our first care is to grind the surface which grips the tooth until it is rather sharp, which permits of a better adaptation and an easier application.

Advantages of the mechanical separator: First, immediate separation may be had in a majority of cases presented. Second, the gum septum is not injured by the pressure of a foreign substance upon it. Third, after an operation has been finished to the point of filling, a few turns of the screw will afford sufficient space for final finishing, which preserves the natural contour so much to be desired, upon its removal the teeth fall back to their points of contact. Fourth, the full matrix may be done away with and in its place a narrow band may be inserted at the cervix and held in place by the lugs of the separator, thus affording the best possible provision for the restoration of full contour. We have now used the Perry separator for a number of years and the results produced warrant its continuance.

We cannot close this paper without a protest against what is

known as "The Universal Separator," for this reason, that it is open to very serious objections when used on bicuspid and molars, especially as the lugs on one side are drawn into the proximate space and thus impinge upon the gum tissue, and, in the case of cavities extending to or beyond the cervix, they are in the way and may check frail walls and margins.

The model which I here present will show the Perry Separator adjusted. It is the separator designed for the bicuspid and molars. I have also placed in the proximate space the peg of wood to show the relative position of the separators and peg. The peg so placed will destroy the gum tissue. The separator used without a peg will preserve it so that a cavity may be prepared and a filling finished and polished with the loss of little blood and scarcely any injury to the gum tissue. You notice there has been cut out a second molar and gutta-percha has been put in its place, allowing distribution of the mallet blow.

DISCUSSION.

DR. J. R. CALLAHAN, Cincinnati: Dr. Barnes wrote me a few days ago he would like me to open the discussion on his paper and I thought I had an easy job, for I thought I had something to say about separators but when I saw the paper I found that he had said all that I wanted to say and perhaps put it in better language than I could. There is nothing to say except about the slight inflammation that follows the use of cotton or wooden wedges or anything of that kind. I advocated them for some time and I know I ruined some front teeth by the use of hard wood wedges.

The rubber also causes as much irritation as the wooden wedge and perhaps the cotton is best. So far as filling the teeth with gutta-percha and allowing it to remain for months, I question whether that is good treatment.

He says, too, that no instrument will work itself. How true that is. An instrument is set aside because we don't generally study it up. Many of my friends in the dental profession say they don't like the Perry separator. I don't understand how it is other than because they haven't studied them, or have used inferior separators and have laid them aside as not good. I think no dentist who becomes familiar with them would do without them. You know how difficult it is if you get started to making a particular finish; if you get started in and have a small space it is more than likely you will spoil the contour, whereas if you have a separator, another turn will make the finish.

As to the universal separator, I will condemn any separator but the Perry. I have some separators which I would like to give away to somebody I have some spite against. If any one who has not tried this method of separating teeth would take one or two of these separators and use that one or two in a few cases until they got the hang of it and learn the superiority to the use of gutta-percha and such other methods, they would soon have a full set of the goods.

DR. FRANK HUNTER, Cincinnati, stated that he had had no experience in mechanical separation, but said that Dr. Heise had a varied fund of knowledge on the subject—it was difficult to extract, and stated that he would like to introduce and hear from him.

DR. O. N. HEISE, stated that the subject was covered so thoroughly by the paper that he had nothing to say about it; that he had used the separator for a number of years in the same manner as Dr. Barnes and he could only add his word of recommendation in the use of it.

DR. GRANT MITCHELL, Canton: I don't believe I can add anything to what has been said. I use the Perry separators and couldn't keep house without them. The manner in which they keep the rubber out of the road and the facility with which one can get at his work make them remarkable instruments. When here last winter I was talking with Dr. Sillito in reference to separators, and where one has time to separate the teeth he showed a simple device that struck me forcibly and I have used it frequently. I don't know that I can illustrate it perfectly, but I will try. (The Doctor then illustrated from the blackboard.)

That represents the set of teeth. Dr. Sillito gets a little tape at a dry goods store—a very fine linen tape. It is used in trimming children's clothes and so on. He takes a piece of that tape and passes it between the teeth. Suppose I want to separate those central incisors. I pass the tape between the teeth and tie the knot around and drive it in between there and the force of the knot being drawn in between will exercise a mechanical influence there—the swelling of the fiber will make a separation. If there is a large cavity it is difficult to tie that knot. In cases of that kind I pass the knot between the teeth and put a piece of cotton in to fill the cavity and then pull the knot. The credit of that is all due to Dr. Sillito. There is no separator like the Perry.

DR. C. R. BUTLER, Cleveland: I have nothing special unless to add something in the way of referring to this tape. It is a very nice thing I know from experience. There is another mode which was suggested a little time ago by Dr. Palmer of Syracuse. It is a peculiar kind of fiber, very fine that is used by anglers as a fish line and it has great strength. You can draw it through between the teeth and it is surprising how the stiffest tooth will be moved by that fine twine. I was surprised

when he presented it and looking at the size of it I couldn't see how it could have such power, so that the stiffest tooth can be separated a considerable space with a very little soreness. I think Dr. Mitchell stated the tying in of this tape and putting in cotton if there was a large cavity there, was an idea presented by Dr. Sillito. That may be true, but there are a great many that profess to have used the same mode as well as Dr. Sillito. This twine—you can take it between the incisors, bicusps and even molars and string it through by the gum and tie special knots in it. It won't slip out because the knots prevent it and there is so little bulk it won't interfere with closing the teeth. If there is a cavity between them, put a little cotton in before tying it tight. You can move your teeth apart pretty readily, within a day or two, and excite very little soreness and it doesn't slip down as the rubber does on those stiff cases where you want to open them without an immediate wedging.

I think I will say a little in regard to the advantage of gaining space. It is imperceptible to the patient. While packing gold there is a good deal said about the use of the band matrix, but should you slip a little piece of steel through, and you could put a little piece of wood there to keep it from slipping down, and if it is a wide space, you can put a piece of wood down here or you can bring the steel up to the cavity, or the adjustable crib, by driving the gold in packing, out against the stub (indicating) in using it not as a means to hold the gold in the cavity, but to pack the gold as if there was no crib there, it will enable you to let it expand against it. You extend the space so you can get a contour in your gold enabling you do the polishing and to finish right away, and you can finish it whether you have the Perry separator or not.

DR. GRANT MITCHELL, Canton: In difficult cases where we want a good deal of space and the cavity is inaccessible, it is difficult to use a Perry separator to gain space. After I have gained space by the tape I will frequently use the Perry separator to hold it, but if it is a case that won't take very long I don't hesitate to put in a piece of wood there.

DR. GRANT MOLLYNEAUX, Cincinnati, says that he don't know anything about separators, that he remembered when Dr. Sillito mentioned the method suggested by Dr. Mitchell but did not know that Dr. Sillito claimed it was original; that Dr. Austin Dunn of Chicago, presented it to the American Association some six or seven years ago. That he never heard anybody dispute his originality in that direction.

DR. W. B. AMES, Chicago: It gives me a great deal of pleasure to meet with the dentists of my native state, and while I don't have as much occasion to separate teeth as a great many, I make use of the Perry separator. I also have a separator made by Ivory, of Philadelphia, and I use it in as many cases as the Perry.

I want to speak of a method that Dr. Bonwill has spoken of. I don't know whether you have seen the results of such a case. I happened to treat a case directly from Dr. Bonwill's hand. A young girl from Philadelphia had some work done by me. In going down to Philadelphia and getting in to some trouble she was taken by the principal of the school to Dr. Bonwill and he adopted this method, and for some reason she didn't return to him. He began the filling with gutta-percha he had put there for a temporary purpose. As a young child she had a slight defect in the arrangement of the anterior teeth above and below. This gutta-percha had expanded and forced apart the bicuspid and molars so that there was more space than any one cared for to make an operation, and there was a marked protrusion of the front teeth above and below which will remain for life. After various operations the space is still there. The separation was very effectual but very disastrous.

DR. H. A. SMITH, Cincinnati: I am very much interested in the subject of separating teeth. I have heard this discussed by such men as Dr. Crouse, of Chicago, and other dentists, and they differ in their method. Dr. Crouse insists he must get a large space between the molars. Another will insist he should get little space. There must be a happy medium. It is important that we should have space sufficient to make a good operation and give a proper contour to the tooth. That depends upon the characteristics both of the patient and the tooth. If we have good teeth and not very permanent foundation, we might resort to the mediate, and if short teeth it would be better to resort to the immediate method. What method you should use depends on the indentation. I don't separate teeth as much as many persons. Perhaps I don't do as much good to my patients. So far as the gutta-percha method is concerned, I think it is admissible. I think the large spaces that have been spoken of show that, judiciously used, it is a good method.

A disaster that comes from undue separation is the result produced upon the periosteum. We attribute this to other causes frequently. In that admirable book that is issued from the press by Dr. Bodecker, he calls particular attention in his allusions to periodontitis, to its being caused by inflammation made by the use of wedges, especially mechanical separators. I think many times periodontitis is produced by these forcible methods that we trace to other causes.

I suppose that I have gone through all the methods. I don't know that I have tried this particular one. It is simply a method for retaining it in position. The cotton fiber expands immensely. It is a very gradual and very excellent way. My one experience has been I would rather trust a gradual separation than a forcible separation. You who have had experience in colleges, know how heroically students use sepa-

rators. They want a large space and they are instructed they must have a large space before they can do well. They use the Perry separator or the universal.

I like one point of the paper, that we must have caution behind it, as to what we shall use and how long we shall use it.

I was very much pleased with the latter part of the paper which I had the pleasure of reading.

DR. A. F. EMMINGER, Columbus: It would seem that Dr. Perry had set things up in this society for his separator. I have not been touched by Dr. Perry, but I think his separators are good things if judiciously used. They can be applied so easily that they have been abused many times. We don't need as much space as we sometimes make. I have used them in the anterior teeth and also in the bicuspid for getting a slight separation, enough to allow for finishing. I have an appliance that is a small straight steel instrument or inverted wedge, very thin, about an inch and a half from the end of the instrument, as thin as these ribbon polishing strips, German silver. I slip that between the teeth and drawing it, instead of pushing, it draws the teeth apart as much as necessary without much pain, and after putting a plug between the teeth, drawing the separator back, remove it, and you can gain space very quickly and without any irritation. I don't know whose instrument it is or who invented it. I think these rapid mechanical separators are good in their place if properly used, but they are abused many times, and the separators are not at fault, it is the power behind.

DR. L. E. CUSTER, Dayton: I think Dr. Emminger has called attention to one good point that ought to be made use of, and that is that pulling the wedge through serves better than pushing one in.

DR. ARNOLD, Columbus: I have used this instrument. It is very useful inasmuch as you don't need to separate your teeth before you begin the operation. We can do a great deal of the work without separation. You only need space for finishing. If you use the instrument described by Dr. Emminger, it is all you need. It is a tapering instrument. Pass in the thin portion and gradually pull through.

DR. J. TAFT: This is a subject of course interesting to every dentist in performing his operations upon the natural tooth, especially in filling. It is one of the principals which should be well understood by every one. You often hear of rapid separation and again others speak of gradual separation. Some advocate one and some the other. Some use both, discriminating, applying them to the cases they think best adapted to the mode of separation. I think the latter is the proper method. It is not best in all cases to occupy several days in making the separation; not best to make a gradual separation in many cases. In

many instances teeth separated in this way become fixed in their new position and either don't return to their former position or become diseased or affected in some way. Both of these results have followed from an indiscriminate gradual separation. I think there is less likelihood of danger from an immediate and prompt separation.

Why do they remain in their new position? When pressure is exerted on that tooth to remove it from its position, a double action is set up—a process of removing on one side and filling in on the other, and if there is nothing to bring the tooth it is likely to retain that separation. I used to feel a good deal of *châgrin* at these things occurring when I used the gradual separation in nearly all cases, as I used to do a good while ago.

The prompt separation made by the separators is, in a great many cases, the very best—better on many accounts. In the first place the operation can be accomplished perhaps at one sitting, whereas if gradual pressure were applied a number of days elapse before it would be accomplished, and in many cases where gradual pressure is applied, soreness would be the result to a considerable degree, inflammation set up, and that sometimes would not pass away for considerable time. I have seen that soreness remain for days after the separation was accomplished before the operation could be well tolerated for the pain. That, of course, is an objectionable state of things.

A prompt separation operates upon the expansive tissue of the tooth. Separated gradually, these would perfectly adapt themselves to the change without bruising the tooth or rupturing the vessels and the gum tissues are enabled to restrain the pressure. If rapid pressure is used there may be a bruising of the periodontal membrane to such an extent that injury will result afterwards. If separation were done gradually, injury of that sort would not occur.

In regard to the appliance used, it doesn't make very much difference except as a matter of convenience as the principle is the same. It is to bring the pressure to bear between the two teeth to give the desired space for the operation and the separator serves its purpose very well—either the Perry or the Ivory separator, which I believe is called the Universal. I use the Ivory separator perhaps more than the Perry. I have used the Perry separator since it was introduced but I have used the Ivory perhaps three or four times where I have used the Perry once. It is easily operated. It is operated by a screw that can be turned a little to make the pressure gradual as it will not be objectionable to the patient, and he can move it gradually as the operation proceeds. It seems to me that one will make the separation more gradual with that instrument than with the Perry separator. You take up that little instrument and make more separation in a brief time than ought to be made.

The age of the patient ought to be taken into account. The susceptibility of the teeth ought to be taken into account. You find some persons that offer firm, solid bony tissue that will not yield under any reasonable pressure. Sometimes the soft tissues are more resistant than in other cases. Sometimes the tissues will yield to the pressure readily. There need be no excuse for ignorance on these points. If one has his patient in hand for a number of years he should know the susceptibility of the patient—how much can be borne by the patient and how much can be borne without injuring the tissue.

In regard to tape and things of that kind put between the teeth, that may be used, but it is no better than a great many other things. A gradual separation can be accomplished in a little while. Place it between and draw it between the teeth, putting it so it will make the pressure before tying the knot, tying it between the teeth, and you make a separation very well, but it takes more time than the Perry or Ivory separator will take.

I can heartily recommend the Ivory separator. I have no interest in it except an interest in using it. I have used the Perry separator and like them. They are more likely to get cranky than the Ivory and I have had the screw to become turned more than it ought to be and it gets caught and it is hard to move it. I have occasionally had that difficulty and I know others have, but nothing of the kind could occur with the Ivory separator. I make separation enough to begin work in the cavity, turning this a little at a time so that the patient hardly knows it.

DR. F. E. BATTERSHELL, New Philadelphia: I have used several of the mechanical separators and when the teeth are closely packed together, in using mechanical separators, there is danger of absorption of the process and a rupture of the vessels at apex of root. The teeth may become twisted by too rapid separation. Now in such cases it should be done by a slow process, by means of tapes or some other means of that kind. Some slight absorption must take place, but these teeth can be separated without harm and it has been my observation that the only thing that is safe in such cases is a slow process.

DR. H. A. SMITH: Just a word with reference to the falsity of all this. If we separate the anterior teeth—those of a single root, how is it accomplished? It must be by the elongation of both teeth, and a very slight elongation will give you space. If it is persistent, it will give you a larger separation.

DR. W. H. TODD, Columbus: I have been using the Perry separators for some time and since using them I find that I separate the teeth less than I did before. In preparing a cavity you often find it is not necessary to separate the teeth as much as you need in the first place.

After excavating the cavity and filling part full a little more force will make space for finishing.

DR. HENRY BARNES, Cleveland: I rise to apologize. I didn't know there was such unanimity of sentiment in respect to the Perry separator. I thought I would encounter considerable opposition, but most of the men who object to the Perry separator are outside of the Ohio Dental Society. Agrees with all Dr. Taft said up to the point where he speaks of the Perry separator and in favor of the Ivory. In the Ivory separator you have two points of contact and so far as the separator getting cranky is concerned, there is no separator that will get quite so cranky as the Ivory separator, due to the unequal shape of the teeth on the lingual and labial surfaces. With the Ivory separator you bring your points together and the separator is liable to a movement back and forth and by that movement you produce pain. In the Perry separator, as illustrated on model, there are three points of contact on each tooth. The lugs grip the tooth at the buccal and lingual angles, while the gutta-percha placed under the bow on the occlusal surface makes the third contact—thus affording steadiness during separation. When you mallet upon them you are not driving the teeth against the cushion and you are not getting up an irritation as you are under the old method.

I realize there is more than one way of killing a pig. You may stick him in the neck and he is dead. You may hit him in the head and break his leg and otherwise maltreat him, you don't deny the pig is dead but it is not the kind of a dead pig you have in the other case. The value of a Perry separator or any other is in the use and not in its abuse.

In regard to the instrument spoken of by Dr. Emminger, in my hands it is the most painful instrument I have ever used for the separation of teeth.

If I understand Dr. Taft rightly in regard to the Perry separator getting cranky, it is where he has turned one of the bars a little more than he should have done, without turning the other side. If you turn it gradually and don't take it as you would a crow-bar to lift a house, but take hold of it, turn it very gently and bring it around to the points of contact on each side, it is drawn up easily and you have no impinging upon the gum. Every turn of the Ivory separator brings a single point against the tooth and upon the gum tissue, and more than that, it is in the way.

I have used about everything that has been spoken of except the method of Dr. Butler. I don't know anything about that.

THE SEMI-CENTENNIAL OF ANESTHESIA.

Special report for OHIO DENTAL JOURNAL.

At a meeting of the American Dental Association, in Old Point Comfort, steps were taken providing for a suitable commemoration of the fiftieth anniversary of the discovery of anesthesia.

The celebration set on foot was held in Philadelphia, Tuesday, December 11, 1894.

The afternoon exercises were held in Association Hall, the large auditorium of which was well filled with those interested in the proceedings.

Promptly at 2 o'clock, Dr. J. D. Thomas, chairman of the executive committee, called the meeting to order and after announcing the banquet to be held in the evening, introduced Dr. J. Y. Crawford, of Nashville, Tenn., president of the American Dental Association under whose auspices the celebration was held.

Dr. Crawford, in assuming the chair, recited briefly the resolution for the appointment of the committees to take control of the celebration, and stated that in pursuance of that resolution and by direction of the association he appeared to inaugurate the celebration of the fiftieth anniversary of the discovery of anesthesia. He could not detain the audience to examine the reason for the holding of this celebration under the auspices of the American Dental Association. It was enough for dentists to know that fifty years ago to-day a discovery was made through which the whole human race was benefitted, by the first legitimate exhibition of surgical anesthesia, and that to a dentist should be accorded the honor of the discovery.

Dr. Thomas Fillebrown, of Harvard University Dental Department, read a paper entitled,

"HISTORY OF THE DISCOVERY OF MODERN ANESTHESIA,"

of which an abstract follows :

Fifty years ago to-day there was enacted in the city of Hartford, Conn., the first scene in the development of the grandest and most beneficent discovery the world has ever beheld—the discovery of modern anesthesia. To pay our tribute to the dis-

coverer let us examine the testimony, restate the facts, and again judge their value.

Dr. Fillebrown then traced briefly and succinctly the search of the ancients to produce insensibility to pain, but none proved reliable. It was a pity that Sir Humphrey Davy's suggestion in 1800 that nitrous oxid might probably be used to advantage during certain surgical operations, should have laid buried under the forgetfulness of forty-five years.

Two agents, protoxid of nitrogen and sulphuric ether were both inseparably connected with the discovery of modern anesthesia. The former was discovered by Priestly, described by Davy and practically applied by Horace Wells in 1844. The latter was discovered in the thirteenth century, described in the sixteenth, named in the eighteenth and practically applied to produce surgical anesthesia by Morton in 1846. Ever since 1818 the physiological action of that drug had been well understood. On Dec. 10, 1844, G. Q. Colton delivered a popular lecture on chemistry in Hartford, administering the "laughing gas" for the amusement of the audience, among whom was Horace Wells, who had for years believed it possible by the inhalation of certain gases, especially laughing gas, to produce a degree of intoxication that would obtund the pain of surgical operations. After inhaling the gas himself and watching others under its influence Wells repeated his thought to a Mr. Clark. The next morning Mr. Colton gave a private exhibition at which Mr. S. A. Cooley, a druggist, while under the influence of the gas severely bruised his knees, without feeling pain. Wells at once determined to have a troublesome wisdom tooth extracted, after inhaling the gas, as a test. A number of the party repaired to Dr. Wells' office, where Mr. Colton administered the gas and Dr. Riggs extracted the tooth. As soon as Wells recovered he said "A new era in tooth-pulling; it did not hurt me at all!" Dr. Riggs who reports this occurrence, says that Wells continued to use the gas at all times when he was in the practice of his profession.

Thus was the deduction and suggestion made by Davy in 1800 verified by Horace Wells, the prophecy fulfilled and practical anesthesia became a discovered and demonstrated reality.

Commenting on the failure of the surgical world to recognize, Dr. Fillebrown said: "When we realize how hard it is to compel attention to a new idea; how slow is the accumulation of

new facts; how gradual the growth of perception and how great the magnitude of this subject, we cease to wonder at the slowness with which the significance of this event was appreciated.

The names of John M. Riggs, G. Q. Colton, E. E. Marcy, W. T. G. Morton, James Y. Simpson, Charles F. Jackson, Oliver Wendell Holmes, and Henry S. Bigelow, will be associated in intelligent discussion of the discovery with that of Horace Wells. Of these Dr. Marcy and J. Q. Colton survive. The part borne by Riggs and Colton has been referred to. Marcy suggested to Wells the use of ether, and verified its action; Morton made the first public application of ether for surgical anesthesia; Jackson claimed to have suggested all that Morton knew about ether; Simpson discovered the anesthetic power of chloroform; Holmes suggested the name "anæsthesia." Dr. Bigelow's connection with the discovery was important. He was the one that saw that event of a life time was taking place; he made a clinical study of the subject, practically supervised etherization during the first year of its use, in more than one instance preventing fatal results from over anesthesia, announced to the world the discovery of the use of ether in a paper read before the American Academy of Medicine, November 3, 1846, and verified the anesthetic power of nitrous oxid in 1848. Had he been present at Well's first experiment it is not unlikely that the course of events would have been materially different.

With reference to the claim of Dr. Crawford W. Long to the honors of the discovery of anesthesia through having used ether for anesthetic purposes three times during 1842-3, the paper noting that no word was said about this use till five years after Wells' discovery quoted the remarks of Dr. R. M. Hodges: "Not a physician or surgeon ever used ether because Long had used it; nor did mankind learn from him that anesthetic inhalation for surgical purposes was possible."

After adverting to the known facts which disprove the earlier ideas and statements as to the anesthetic characteristics of nitrous oxid and anesthesia in general, the paper stated as established by indisputable sworn testimony: "That in 1840 Dr. Wells expressed his faith in the anesthetic power of nitrous oxid: that on Dec. 11, 1844, Wells inhaled nitrous oxid and had a tooth extracted painlessly, which became known at once throughout the vicinity of Hartford; that he forthwith went to Boston, and through

Morton, who had been a pupil of Wells in 1841 and a business partner in 1842, he was invited to speak before the students of the Harvard Medical School, before whom he, a little later demonstrated his discovery with incomplete success; that a month later Dr. Marcy suggested to Wells the use of sulphuric ether, and removed a tumor painlessly from the head of a patient under its influence; that in July, 1845, Morton was referred by Wells to Jackson for information about the manufacture of gas; that Wells, Riggs, and others continued the use of gas till November 6th, 1846, when chloroform and ether were substituted and gas remained unused till 1863; that the use of gas for anesthetic purposes is recorded in the *Boston Medical Journal* of June 18, 1845; that Morton's first successful operation with ether was on Sept. 30, 1846, and on the 16th and 17th of October following he administered ether to patients at the Massachusetts General Hospital; that about October 20, 1846, Jackson claimed \$500 as compensation from Morton for professional services; that on October 27th, 1846, Morton and Jackson made oath to a joint discovery of a *compound* for the prevention of pain during surgical operations, and applied for a patent, which was granted, but declared null and void in 1863, as such a discovery was not patentable; that on Nov. 9, 1846, Morton declared it was simply sulphuric ether, not a compound; that in the autumn of 1847, Jackson and Morton each claimed to be the sole independent discoverer of anesthesia, and so contended to the end; that in 1847 the Paris Academy of Medicine on *ex parte* evidence declared Morton and Jackson the discoverers of anesthesia; that in January, 1848, the Parisian Medical Society after a full hearing awarded the honor to Wells and elected him an honorary member; that in 1846 the surgeons of the Massachusetts General Hospital gave Morton the credit of being the discoverer of modern anesthesia; that in 1853, five years after Wells's death, Dr. J. C. Haywood, one of the surgeons present at the first operation, wrote that "to the spirit of Horace Wells belongs the honor of having given to suffering humanity the greatest boon it has ever received from science."

Upon the memory of Horace Wells there remains no blot or stain; no charge of selfishness, dishonesty, deceit, or unfairness was ever made; he lived and died, honored and respected by the people among whom he dwelt. "We lay our wreath upon his tomb. Would that we to-day might with it crown his head."

Coming generations will recognize in him the martyr and the world's benefactor; and on every monument which in the future may be raised to commemorate this great event will be inscribed, 'To the Discoverer of Anesthesia, Horace Wells.'"

Dr. Crawford then introduced Prof. James E. Garretson, of the Philadelphia Dental College, who, before commencing the reading of his paper, called attention to the fact that Gardiner Q. Colton, one of those who took part in the discovery of anesthesia by Horace Wells, was in the room.

The announcement was received with cheers, and Dr. Colton was immediately escorted to the stage.

Dr. Garretson then read his paper, which was entitled "The Appreciation of Anesthesia to Surgery and Benefits to mankind."

In an eloquent introduction, Dr. Garretson called Horace Wells a seer, as Newton was the seer of the law of gravitation, Edison of electricity, Fulton of the steamboat, Stephenson of the locomotive: "Was not the ghost of anesthesia with the camel droppings? Was it not with the dudaim, the Devil's apple, of the Arab? Has it not been with alcohol since men distilled and knew this agent? Is it not with the poppy through all the ages that fields have been made red by this plant? The place of Horace Wells in history is at the culmination of all this. He saw what had never before been seen by mortal man,—anesthesia. "Was anesthesia, as anesthesia, known to surgery before 1844 as it became known in that year, and since remains known? Not nitrous oxide, not ether, not chloroform, not rapid breathing, but anesthesia. Who was the man of that year? Horace Wells. This, it seems to me, settles the question. It is not necessary in this presence to enlarge, beyond a very few sentences, on the benefits of anesthesia to humanity. Are not all here assembled doing, and experiencing, each after the manner of his work, what I did and experienced yesterday. Upon the operating table of a hospital lay sleeping sweetly and quietly as ever baby slept, a member of our fraternity. In place of an ordinary neck was a tumor that reached from chin to sternum and from ear to ear. Wherever, as it proved, reaching fingers could reach, prolongations of this mass extended themselves, salivary glands, trachea, carotid arteries, jugular veins, pneumogastric nerves, all were more or less embraced and wrapped about. Yet, while so horrible a dissection as was required to remove the mass went on,

sleeping and dreaming quietly continued, nor was any consciousness had by our brother of his horrible experience until an hour later he awakened snugly tucked away in one of the most comfortable of beds, the tender hand of a nurse wiping away the cold sweat drops standing threateninly on his forehead.

"Consider in contrast, a picture familiar before the day of Horace Wells's inspiration: a mother, heart welling out in tears, limbs trembling so as scarcely to afford her support, helpless misery marking her countenance, despair striking at her with its thongs of flame, follows into hospital operating amphitheatre a nurse who carries her first-born, which is being brought to the table. Alas, helpless indeed is the mother. How more than gladly, how a thousand times more gladly would she lie down in place of the child. Cries of mother and child moan through the hospital and the least sensitive feels his cheek pale. The crucial moment has come. The child is placed and held by force upon the table. The mother is torn away. For a single moment, eyes of mother and child have met in parting. A loud, frightened, despairing cry from the child rings from ceiling to floor of the room. The mother drops in a heap and is carried out a raving lunatic. She raves about and curses God as being without pity or mercy.

"Let a picture of to-day have relation with that other one of the past,—one which extended, alas! from the days of the first surgical performance to the year of grace eighteen hundred and forty-four.

"A mother brings to a hospital a child whose deformity requires the knife for its correction. Conscious of the power of anesthesia the surgeon talks to the parent while the little patient pleased, and inveigled, by the sweet smell of chloroform is anesthetizing itself. The cutting is done. The child has a dream of roses and gardens and wide fields. The mother has placed in her arms her restored offspring. She has no tears, no words, her contact has been alone with beneficence. She is overwhelmed by the mystery met and passed. She says "Our Father which art in Heaven." She says and feels there is a God of pity and mercy.

"Look at the name of the maker of these pictures of the new time. It reads, Horace Wells."

To what extent anesthesia has cultivated sensibility I leave

every surgeon to judge. Who, if suddenly transplanted into the olden times, being possessed of his present knowledge of anesthesia could handle a knife without cutting everywhere else than where it would be desirable to cut, otherwise dying shortly out of sympathy for his patients. Could he say "Merciful Father which art in Heaven" in place of pitiless devil who is in hell. Alas! how near to hopeless atheism may ignorance bring a man. Hail! that knowledge shows God and Father everywhere. Hail to all poets to the music hearers, to the seers of forms of every kind. Let statues be stood for such in the squares. Let tablets of enduring brass mark their working places. Let us place, and hold them, with the immortals.

"Hail to him who has proven to be, perhaps the greatest of the Seers, Horace Wells."

Dr. L. D. Shepard, Boston, presented, at the request of the executive committee, the following resolution, which on motion of Dr. John S. Marshall, of Chicago, was adopted, unanimously:

Resolved, That we reaffirm and emphasize our belief that the observation of Horace Wells was essentially a discovery original with him. We do not claim that his was the first discovery of the same fact, but accord priority in this to Sir Humphrey Davy. And with respect to the honors due to each we call attention to the historical fact that it was from the discovery by Horace Wells that the direct benefits to humanity were achieved.

Dr. Robert Huey, Philadelphia, moved that a committee be appointed to take in hand the matter of the erection of a permanent memorial to Horace Wells, in Washington. The motion was carried, and the chair announced that the names of the committee would be announced later.

Dr. Colton was received with cheers and told at some length the story of the occurrences of the 10th and 11th of December, 1844, substantially as before rehearsed in Dr. Fillebrown's paper. He added that Dr. Wells was very enthusiastic over the result of the experiment. When he saw the tooth, he slapped his hand on his knee and exclaimed that it was the greatest discovery ever made. Afterwards his health gave out, and he went to Europe, where the honorary degree of M.D. was conferred upon him. When Wells returned, he was astonished to learn that Morton had got a patent and derived the honor of the discovery. Then ensued the acrimonious dispute in the *Boston Medical and Sur-*

gical Journal, so worked on Wells's sensitive nature that he became deranged and committed suicide. Wells was the only man to use nitrous oxide until 1863. After his death, Morton claimed that anesthesia could not be produced with nitrous oxid, and that therefore he, Morton, was the discoverer. Some years afterward, in June, 1863, the speaker lectured in New Haven, and among the subjects who presented was Dr. J. H. Smith. The next day, while in Dr. Smith's office, an old lady came in who had asked Dr. Smith to extract some teeth for her under chloroform, but had refused, unless her physician was present. After some talk, he (Mr. Colton) administered nitrous oxid and Dr. Smith extracted seven teeth for her without pain. He then made an arrangement with Dr. Smith, which lasted three weeks and two days, during which time 3000 teeth were extracted. He went to New York and opened the Colton Dental Institute for the extraction of teeth under nitrous oxid, on the 15th of July, 1863. In the February following they began to collect the names of those whose teeth were extracted under the anesthetic. There are now 186,600 on the list, and there has never been an accident from the gas.

Dr. Crawford then introduced Charles T. Wells, of Hartford, a son of the discoverer, who was heartily received, and returned his thanks for the reception.

On motion of Dr. H. C. Watkins, of Montclair, N. J., the meeting proceeded to elect a treasurer to take charge of funds contributed to the memorial, and Dr. J. D. Thomas, of Philadelphia, was chosen.

Dr. Williams Donnally, Washington, D. C., moved that the committee be appointed by the chair or permanent memorial take into consideration the establishment of a national museum and library. So ordered.

The session then adjourned.

At the banquet in the evening, at which Dr. E. T. Darbey, of Philadelphia, acted as toastmaster, the following toasts were responded to, as follows :

The Horace Wells Discovery,—Its National Significance.—Gen. Joseph R. Hawley, U. S. Senator from Conn.

Anesthesia as a Dental Discovery.—Prof. James Truman, University of Pennsylvania.

Anesthesia as a Factor in the Evolution of Surgery.—Prof. J. William White, University of Pennsylvania.

The Debt or Medicine to Anesthesia.—Prof. H. C. Wood, University of Pennsylvania.

The Mastery of Pain from the Standpoint of the Layman.—Col. Alexander McClure, Editor of *The Times*, Philadelphia.

The Development of Our Knowledge of Anesthesia.—Prof. Wilbur F. Litch, Pennsylvania College of Dental Surgery.

The Medico-Legal Aspect of Anesthesia.—District Attorney Geo. S. Graham, Philadelphia.

The Humanitarian Aspect of Anesthesia.—Rev. S. D. Mc Connell, Philadelphia.

An Historical Reminiscence.—Dr. G. Q. Colton, New York.

A Personal Reminiscence.—Mr. Charles Wells, Hartford, Conn.

ALL SORTS.

To True up Corundum Wheels.—Place the corundum wheel in hot water till somewhat soft, and then press the side most used against glass. It will be trued almost as perfectly as when new.—ED. *Items*.

Cyst of the Antrum of Highmore.—Otto Umgren had under his care a baker of 35 years, tall and thin, who for a long time had suffered from pain and swelling of the right cheek. Sensibility to pressure, however was not increased. The tumor was hard and firm. Extraction of the first molar gave exit to a large quantity of sanguinolent pus having a bad odor, but not fetid. On sounding through the extraction wound, Umgren found a cavity the size of a small hen's egg, extending in various directions. There was no issue in the nasal cavity for the pus, which had accumulated in the antrum of Highmore.—*Journal Odontologique*.

To Prepare Gutta-Percha Filling Material.—A method is given by Dr. A. H. Stoddard, Boston, in the *International Dental Journal*, to prepare a gutta-percha filling material that softens at low heat, packs readily in the cavity, does not drag, yet becomes hard after it has been in the mouth for some time.

It is prepared from Knapp's sheet gutta-percha, is cut into strips, and allowed to stand two or three days in a solution of oil of cajuput and chloroform, equal parts. Then it is warmad till it becomes thoroughly soft, and plaster of Paris is added till it becomes about the consistency of putty. It may then be taken into the hands and kneaded thoroughly, rolled into strips, and allowed to remain in the open air till the chloroform and cajuput evaporate, when it is ready for use.

Biddle (E. D.) on Caps for Gold Crowns.—Take the small impression-cup of Melotte's and first fill it with compound. Select a tooth the cusps of which are suitable (Logan crowns make the most perfect forms), press it down into the compound, leaving enough exposed to form the cap. Smooth the compound, have the exposed cusps clean and dry, place the rubber ring on, and while you are heating the fusible metal hold a hot instrument against the cusps. Pour slowly and agitate the cup while pouring, and you will have a die with smooth and polished surface. The same principles of procedure are suitable for cuspids and incisors.—*Dental Cosmos*.

About Impressions and Casts.—Dr. M. D. Jewell, of Richmond Springs, says that he was brought up on plaster, but now prefers modelling composition, especially for lower dentures. It took him a long time to learn how to use it, but he finally succeeded. In getting his impression with it in partial cases, he found it difficult to prevent its drawing from the palatal portion, but he learned to remove it from the mouth after the impression was partially taken, and soften the surface of the composition over a flame, and then replace it in the mouth and press it firmly to place. In this way he got a good impression. In using plaster he soaks the cast thoroughly with water before packing; thus he gets a perfect cast without pits or roughness. He objects to the use of soap, as it softens the surface, but uses shellac, varnishing the plaster thoroughly, then lathering it well with soap. In this way he gets a cast perfectly smooth.—*Extract Dental Cosmos*.

Curious Property of Aluminum.—Charles Margot, preparator at the physical laboratory of the University of Geneva, has recently made a curious discovery concerning aluminum. He has found that if glass be rubbed with a piece of this metal, very brilliant markings will be obtained that no amount of washing will cause to disappear. This property of aluminum of adhering strongly to glass, and to silicious substances in general, is especially manifested when the rubbed surface is wet with water or simply covered with a stratum of aqueous vapor.

Mr. Margot has constructed a small aluminum wheel which revolves very rapidly and with which he makes designs upon glass after the manner of ordinary engravers. The designs are metallic, chatoyant and brilliant, and, by burnishing with a steel tool, they may be even made to have the appearance of metallic inlaid work. The adhesion is absolute. But it is necessary to see that the glass as well as the aluminum point are perfectly clean.

This property of aluminum permits of immediately distinguishing the diamond from glass. While, in fact, aluminum leaves a very apparent trace upon crystals of the latter, it has no action whatever upon the diamond.—*American Druggist*.

Temporary Dentures.—Dr. C. H. West explains, in the *Items of Interest*, his method of inserting teeth where they are wanted as soon as possible after extraction. He says :

“ I first have water hot, in which to soften modeling compound, and then extract the teeth, and take the impression as soon as I can, so as to get it before the swelling takes place. In the model I deepen the depressions caused by the removal of the natural teeth and insert the porcelain teeth, as near as possible like the natural ones, and finish the plate as soon as I can and get it in the mouth. The false teeth may be inserted farther in the socket than one would think, without any inconvenience to the patient after the first few minutes. The gums settle around the teeth very naturally, and as the gums shrink the teeth still have a solid foundation. I inserted teeth that way seven years ago that are still giving perfect satisfaction as to fit and appearance. In replacing the four or six anterior teeth I always like to follow this method when it is practical to do so. In case a patient does not want to appear without teeth, I sometimes take an impression before the teeth are extracted, cut off the teeth on the model, and dig out for the porcelain teeth to correspond with the teeth to be removed, and scrape off a little from the palatogingival margin of the ridge and make the plate, and then extract the teeth and put in the plate immediately.”

The Causation of Dental Erosion.—In an interesting article on this subject by Dr. A. P. Brubaker, Philadelphia, in the *International Dental Journal*, the author states that he believes that *acid sodium phosphate* is the eroding agent. Regarding its presence in the labial glands he says :

“ It may be said that the acid which is theoretically most likely to be present in the secretion is one derived from its normal constituents. It will be recalled that among the salts there is present in considerable quantity sodium phosphate, a distinctly alkaline salt. One of the peculiarities of this salt is that it readily parts with one atom of its sodium when brought into relation with carbonic acid, when it becomes the well-known acid sodic phosphate. The source of the CO_2 must be sought for in the metabolism of the gland-cells. In the normal activity of the glands the CO_2 produced appears to be insufficient in amount to bring about this conversion. But with increased vascularity and, in consequence, heightened cell activity, the production of CO_2 must be very considerably increased. Under such circumstances it is easy to see that it might combine with all the sodium phosphate with the production of the acid salt.”

In concluding the paper, he suggests electrolysis, in the manner used to destroy hair-follicles, to destroy the offending labial glands and thus get rid of the acid phosphate excretion.

To Fit a Dowel-Pin and Crown to a Badly Decayed Root.—

At the New Jersey State Dental Society Dr. F. T. Van Wœrt, of Brooklyn, spoke of the following method, which we extract from the *Dental Cosmos*:

"I became convinced long ago that the dowel or pin of a crown should be made to conform as nearly as possible to the excavation in the root, and in cases of excessive caries I have adopted the following method:

After excavating as carefully as possible, being particular to have a perfect draft, I insert a piece of copper wire or iron, whichever is most convenient, hold it in the center of the excavation, as here described, and pack around it ordinary gutta-percha, which I cool and remove, using the wire as a leverage to the core. This I invest in equal parts of plaster and marble-dust, and, after it becomes hard, remove the gutta-percha, which leaves me a mold the exact form of the root to be crowned. Now place this upon the gas stove until thoroughly dry, and heat to a temperature sufficient to fuse ordinary tin solder, filling it with the same; then I take a Logan, or any other dowel crown, coat it, that is to say the crown itself, with sweet oil, and the pin or dowel with a solution of chlorid of zinc, heat is hot as possible without cracking the porcelain, and insert it into the mold containing the soft solder, at the proper position and angle, and cool immediately. The result will be an adhesion of the tin to the platinum pin, and a dowel which can be inserted into the root by the use of so little cement that it would be impossible to heat it or change its diameter.

I have been using this sort of fixture or method two or three years, with more than satisfactory results."

Systemic Treatment of Dental Diseases.—"In seeking the help of systemic treatment," says Dr. L. A. Faught, Philadelphia, in the December *Dental Cosmos*, "it is ever to be borne in mind that medicines act on the body at large in three ways,—first, by their control of tissue waste and repair; second, by their direct effect on the various organs; and third, by their effect on the various secretions and excretions. Selection of a drug is therefore to be made with one of these effects in definite view. Take for instance, that condition of stomatitis connected in elderly persons with a strong bilious temperament. The mucous membrane is dry, and the tongue heavily coated. Any operation on the teeth involving the use of rubber-dam or napkins will have each sitting followed by an aggravated exhibition of oral ulcers. I have had the most happy results follow the use of—

R̄—Nitro-muriatic acid *dil.*, gtt. x;
Tinct. gentian comp., f 3 ii.

after meals, coupled with the use of a teaspoonful daily of Parke, Davis & Co.'s maltine with cascara sagrada. Here, in the first place, treatment is directed toward the action of the liver, and in the second place to obtain a laxative effect upon the intestinal tract.

In those conditions in which nervous females show marked lack of nervous tonicity, through weakness or dread of the operation, thirty to sixty drops of the aromatic spirits of ammonia, administered in a little water at the time of their taking the chair, has most markedly afforded relief and made comfortable what would otherwise have proven a severe strain.

In acute abscess, the prompt exhibition of cinchona in large doses of fifteen grains (with due regard to the idiosyncrasies of the patient) is indicated, together with the use, during the feverish, protracted nervous condition at night, of liquor ammonii acetatis; and the occasional sipping of a glass of water in which has been placed twenty drops of tinct. opii.

This method of using opium I have found peculiarly happy, its concomitant use with cinchona, affording in many cases of such inflammation the promptest relief."

Diagnosis of Alveolar Sarcoma of the Soft Palate.—Dr. A. Schmitt, of Munich, Germany, observed an alveolar sarcoma in a tall, pale boy of twelve years. The tumor, when first noticed, was of the size of a pea, and situated near the margin of the soft palate and its attachment to the roof of the mouth. It had been removed four times, but it had always immediately returned and grown rapidly. When seen, eighteen months after its removal, it was two cms. long, one-half in breadth, and one-half a cm. in height. It was sharply circumscribed, of a reddish color, and resembling a raspberry in appearance from its granular exterior. It was covered with a smooth and shining membrane, but it bled easily on touch. The diagnosis was to be made between simple papillomatous excrescences of the glands of the mucous membrane, adenoma, carcinoma and sarcoma. The former could be excluded by the prompt appearance of the tumor after removal; adenomata of the soft palate are circumscribed, more or less hard tumors which are covered with normal mucous membrane, and may be enucleate without a knife from their investing membrane or capsule. Carcinoma was not to be thought of, as there was an utter absence of glandular involvement, in spite of the growth having existed for so long a time, while again, his age would tend to exclude this form of cancer. His appearance and the course of the neoplasm were all in favor of sarcoma. At the operation, it was discovered that it extended deeply into the surrounding sub-mucous tissue, so that a large amount had to be removed. Microscopically, it

was seen to be an alveolar sarcoma. Tumors of the soft palate are relatively rare. A large number have been reported where the growth was found to be a carcinoma, a sarcoma, a myoxoma, mucous polypus, enchondroma, adenoma or a mixed tumor, but as yet no alveolar sarcomata. Adenomata and sarcomata are the most frequently observed. Adenomata very rarely infiltrate the surrounding tissues diffusely, for nearly always they are sharply circumscribed growths of so benign a character that one writer has said that "they are as harmless as unborn babes." The same may be said of the majority of sarcomata. Bergmann states that they are entirely typical tumors, mostly of a fibrous structure. "They may be as easily taken out," says Volkmann, "as a gold piece out of one's pocket-book." This observation, on account of the diffuse infiltration and microscopic character, can not be classed as one of such tumors.—*Muenchener Medicinische Wochenschrift*.

Some Laboratory Hints.—Dr. G. B. Snow, Buffalo, states in an article in the *Dental Cosmos*, that "Sulfate of potash is often added to the plaster to make it set more quickly; but I do not approve of the practice, as I do not believe the plaster is as hard with this addition as without. It may be also observed that there is little or nothing gained by using very little water in the plaster. Enough may be used so that the mixture will flow readily, and when set the mass will be as hard as though less water were used.

"I believe in allowing plenty of time for the plaster to become thoroughly hardened before vulcanizing, and I believe that the darkening of the joints, when section teeth are used, is in some instances, partially at least, owing to the undue hurry of the dentist to get the case into the vulcanizer.

"Before packing, the face of the model is either covered with tin foil, or treated with collodion or liquid sillex. The former is cemented to the model with thick shellac varnish, and if afterwards rubbed with soap, it is quite readily peeled from the rubber. Thin foil, such as is used for filling teeth, is used for this purpose, and if it should stick to the rubber it can be dissolved by immersing the unfinished plate in a bath of hydrochloric acid for a short time. The action is hastened by the addition of a small quantity of nitric acid.

"Collodion is sold at the dental depots under the name of ethereal varnish, and at an extravagant price. Any photographer can furnish plain collodion, which will answer the purpose equally well, and for less money. This is painted onto the surface of the plaster before packing the mold.

"Liquid sillex, or soluble glass, is quite largely used for coating the mold, and serves an excellent purpose, but it requires some precautions

in its use to attain the best results. First, the surface of the plaster must be clean, so that it will freely absorb the silex when applied. If it has been oiled, or if wax has been melted into it, the silex will not be absorbed, and though it may be of some benefit, will not be fully successful. Secondly the silex must be quite thin, and should be diluted by the free addition of boiling water. It is well to have a second vial into which a small quantity can be poured and diluted for use. It must be kept free from fragments of plaster or other dirt, as it is easily decomposed. Thirdly, it should not be applied until a very short time before the mold is to be packed and vulcanized. After a few hours the silex is decomposed by the action of the plaster upon it, and a part, at least, of its good effects will be lost."

Hodson (Dr.) on an Improved Form of Matrix.—It has been upon my mind for a long time to present to you a very delicate, very simple, but strong, little matrix, which I have used with much comfort for several years, and will, with your permission, present it now.

To premise, I have never felt justified in using the matrix before devising this one, as all others that I have ever seen—excepting Dr. Jack's, and that is thick and requires much space—are practically but straight bands encircling the tooth, and giving convexity but in one direction. One is scarcely better off at the end of using them than with none, as the same straight cut across is left in the former case as the file would make in the latter. In a word, I feel the necessity quite as great for convexity of the stopping from grinding surface to cervix, as from buccal to lingual surface. This I have never seen accomplished by any matrices.

I cut a small piece, sufficient to cover the approximal surface of the tooth, from thinnest ribbon steel, after drawing the temper, then actually stretch, not merely bend, it concave upon a piece of lead by striking with a small hammer a small convex tool held upon it; a tiny hole is punched through each side at the extreme edge, in which to insert little pointed instruments when it needs to be moved or withdrawn. This is slid with a curving motion into the space, being helped to its position with, say, a large plugger. If it strikes the cervical edge of the cavity put a plugger point into the cavity against the edge that catches, and gently pry it away while you push the matrix past it and home. This all takes but three or four minutes to make and apply, though I keep on hand a lot of different sizes and convexities, from which almost any presentation may be fitted.

Once adjusted it fits like a glove, and the stiffness produced by the hammering, combined with the impingement of the convex side against the contiguous tooth, keeps it snugly in place; while, on the other hand,

the edges, being free and springy, admit of the production of absolutely perfect filling margins. In some cases—like long teeth—it is prudent to make the matrix narrow, and then slip it upward as the filling progresses. The entire finishing (of course, after very thin burnishers) is accomplished with the thin approximal tapes. So exquisitely do these slips of matrices do their part of the work, that I often build up two contiguous surfaces with no previous wedging, and, while the cervical and other margins are perfect, the two rounded surfaces of the stoppings are so closely adjusted to each other that the floss just catches—as it should—at the convexity. In the case of amalgam stoppings, I usually leave the matrix *in situ* over night, being careful, of course, in its adjustment, that the antagonizing tooth does not hit it.—*International Dental Journal*.

A Possibility in Tooth-Filling.—Several years ago Dr. J. S. Cassidy said the ideal filling would ultimately be one of metal deposited in the tooth cavity by electrolysis. His predictions bid fair to become true for several dentists, well versed in electricity, say it is not an impossibility. Dr. L. E. Custer many months ago promised something in the line of investigation and in the December issue of the *Dental Cosmos* Dr. Sigel Roush, of Washington, D. C., says: “To apply the principle of electroplating to the filling of human teeth may be a Utopian dream, but the writer in his experiments has obtained results sufficiently satisfactory to warrant him in believing it can be successfully accomplished.”

Dr. Roush has thus far conducted his experiments on teeth outside the mouth and says that he “has obtained some most perfect and beautiful fillings.” Also, “to procure a filling in this manner outside the mouth is an easy matter. Now with the teeth *in situ* there are a few difficulties to be overcome, but it is the opinion of the writer that they are not insurmountable.” The difficulties are named as follows:

First. “To obtain an appliance to insulate the tooth to be filled, in a water-tight bag or cup.” It is possible to do this by means of a rubber cap or tube fitted closely around the neck of the tooth. The opening to this tube may be outside the oral cavity. In order to watch the progress of the filling, a section of the tube may be of glass. In upper teeth the tube may be bent siphon-like, with the opening kept higher than the tooth. It would thus retain liquid. This would not be necessary in the lower teeth.

Second. “The fluid used may be detrimental to the tooth-structure or poisonous to the patient.” Both objections hold good in some cases, but for filling with gold, silver, tin, or nickel, a harmless fluid is obtainable.

Third. “It would take too long.” A filling may be inserted in this way quicker than the average operator could do the work.

Fourth. "The current might be painful to the patient." The current sufficient to deposit such a filling is not perceptible even when passed entirely through the jaw.

Fifth. "Could a current be induced through bone-substance?" Very easily if moist. A small copper wire brought in contact with any portion of the mouth, or even by means of a damp sponge applied to the face over the tooth, would form a sufficient conductor.

Sixth. "Could the filling material be prepared in a convenient form?" The pure metal is all that would be necessary, prepared in strips or pencils to which one of the poles could be attached.

There may be other objections urged, but none seem insurmountable. The advantages over the present mode of filling are many, and it is the firm belief of the writer that in this way we may produce a true ideal filling."

Management of Pulpless Teeth.—Dr. C. N. Johnson, Chicago, in a paper read before the New Jersey State Dental Society, and printed in the December number of the *Dental Cosmos*, details in a systematic order, his method for managing each of the different classes of pulpless teeth that are encountered in practice.

As a pulp destroyer he prefers cobalt to arsenious acid and his method of using it is as follows:

"After complete exposure of the pulp is gained, a small pellet of cotton, less than the size of the head of a pin, is moistened slightly in one of the essential oils and carefully dipped into the cobalt. The moist cotton will pick up a minute quantity of cobalt, which is then carried to the cavity, and the cotton and cobalt placed immediately on the exposed pulp. Meanwhile the assistant has been mixing some oxyphosphate cement. This is flowed over the cotton to perfectly seal the cobalt in the cavity, great care being taken not to cause pressure on the pulp. In nearly every case of pulp-destruction, cement is used as the sealing agent in preference to gutta-percha. Cement admits of greater certainty of adaptation to the cavity walls, with less danger of pressure and it has long been recognized that much of the pain occasioned in pulp destruction is due to pressure.

"A radical departure from the usual method is now taken in regard to the length of time the application is allowed to remain. Most practitioners, if we are to believe the literature of the subject, allow arsenic to remain only twenty-four hours,—none of them longer than forty-eight. Instead of this, it has for several years been the writer's custom, where molars and bicuspsids have been under treatment, to allow cobalt to remain sealed in the cavity one week. The precaution is taken in anterior teeth to remove the cobalt in twenty-four hours, through fear of discoloration,

though my experience with cobalt would lead me to be less fearful of discoloration in its use than with arsenious acid. It seems to interfere much less with the circulation in the pulp, and therefore would not be likely to cause the extensive disruption of red blood-corpuscles and the infiltration of the coloring matter through the tooth that we sometimes see where arsenious acid has been allowed to remain too long in a cavity. When the cement has been removed from an anterior tooth the cobalt is washed out of the cavity with one of the essential oils, the cavity dried, and a pellet of cotton saturated with the oil is applied for one week. This is again sealed in with cement, and in this connection I wish to emphasize the necessity for using cement as the sealing agent in the treatment of anterior teeth from the time they come under the operator's care till they are permanently filled. Hermetically sealing cannot always be easily accomplished with gutta-percha, and many a case of bad discoloration may be traced to leakage of the sealing agent during the process of treatment. This fact together with others of equal importance, argues for an application of the rubber-dam in the management of pulpless teeth in all cases where there is not absolute certainty of dryness without it."

He cautions the dentist to seal the preparation securely in the cavity so that there is no possibility of the cobalt oozing out upon the gum tissue. In deep approximal cavities where the form of the gingival wall results in a sharp incline from the pulp exposure rootwise toward the gum-tissue in the interdental space the gum is protected in advance of the application by building a barrier of Gilbert's temporary stopping over the interdental space, reaching from the proximal surface of the adjacent tooth over the gum septum and along the gingival wall of the cavity to near the point of pulp-exposure. The cobalt is secured by a cement filling. Continuing he says:

"At the second sitting the rubber-dam is applied, the cement removed, and the cobalt washed out by flooding the cavity with absolute alcohol. This is then evaporated with the chip-blower till the cavity is dry, when a sharp bur is used to thoroughly open up the pulp-chamber. In doing this the bur usually lacerates and cuts into shreds the body of the pulp contained in the chamber, and this, together with the *debris* from the bur is again washed out with alcohol. The openings of the canals can readily be discerned by evaporating the alcohol to dryness, and in passing I may say that the most efficient means of discovering hidden openings of small or badly situated canals under any circumstances is to flood the pulp-chamber with alcohol and use the air-blast till the chamber is quite dry. The alcohol will usually wash out any *debris* that may be plugging an opening in the case of pulps long dead, and in any event will at once disclose the position of the opening by the difference

in color between the *debris* and tooth-tissue when dry. The plan has proved of the greatest service to me in at once disclosing the whereabouts of hidden openings which had long puzzled me on account of their unusual position, and which the broach had failed to find.

"After the bulbous portion of the pulp is removed, the extraction of the portion in the canals may be facilitated by first absorbing as perfectly as possible the moisture from the remaining pulp-tissue. Alcohol, on account of its affinity for water, aids materially in this, and I have recently been employing it in the form of spray for this purpose, and also for drying pulp canals previous to filling."

The writer concludes the paper with the following résumé :

"The writer believes in cobalt for the destruction of pulps. He does not believe in leaving pulp-stumps in the roots of teeth after the application of cobalt, with the idea that they will live, or that they may be sufficiently sterilized to remain healthy. He believes in absolute alcohol for dehydrating pulp-canals, and considers dryness a *sine qua non* to successful treatment. He is not alarmed at the result of any possible coagulating properties of the alcohol when used as advocated. He is opposed to over-treatment, believing that continued operative interference often results in irritation which prolongs the disease. He believes in economy of time both to patient and operator, consistent always with the most thorough work. He believes that most abscesses may be cured with one treatment, but recognizes the chronic cases that require time and patience. He believes that an attempt being made to fill all roots of pulpless teeth, but does not believe all roots can be filled."

EDITOR'S NOTES.

THE CUSTER ELECTRICAL FURNACE FOR FUSING PORCELAIN.

THIS invention is a surprise to everybody.

Think of placing a continuous gum case in the furnace, set your time regulator, press a button to turn on the electrical current, then go about your other business ; for the furnace will take care of itself. The heat is gradually raised, by means of an appliance arranged for the purpose, and when the body fuses the current is automatically cut off. The case is thus properly baked while you are working at the chair.

Can you imagine anything more perfect ?

If you prefer watching the process you can do so ; indeed

the furnace is so small and neatly arranged that it can be placed on the cabinet, beside the dental chair, and the fusing watched while operating.

Aside from the baking of continuous gum it opens a field of usefulness in other ways. The Parmlly Brown system of crown and bridge work is simplified; the making of porcelain crowns made easier; also the staining of porcelain teeth by means of pigments burned on their surface; the soldering of crowns, bridges, etc., more easily accomplished, for any degree of heat necessary can be obtained. At a glance it is difficult to fully realize the many advantages this furnace offers, or to comprehend its workings without seeing the appliance. A splendid description of it however, is given by Dr. Custer in this issue and we advise every reader to carefully peruse it.

Dr. Custer has revolutionized dentistry so far as electrical apparatus are concerned and we may add that the end is not yet; he has more surprises in store for the profession and we anxiously await the perfection of these appliances.

Appreciative of what he has already done for the profession, the Ohio State Dental Society, at its December meeting, voted to present Dr. Custer with a suitable gold medal as a token of appreciation for the inventions he has brought out for the dental profession. A gift to which he is justly entitled.

RECORD BREAKING.

THE year just closed has been an eventful one for record breaking. Look in almost any direction and you will observe a new record here, and a new record there; an advance over the year preceding. In this regard the OHIO DENTAL JOURNAL comes in for its share of the glory; it has broken its record of years previous in the way of subscriptions and is still in the race. To advance in hard times like these is the best indication of prosperity. The Journal seems a necessity to its readers and we hope to keep it in the front ranks of journalism, presenting all things new and of special interest.

We have original contributions promised from men at the head of the profession and the coming volume will to be one of special value. Indeed we expect to make a new record during 1895.

A large advertising agency in an eastern city has for its motto: "Keeping everlastingly at it brings success." This is what we are doing and propose to continue to do. We feel gratified for the many kind words spoken for the Journal and hope to make it more and more valuable as time goes on.

We desire, at this time, to thank our subscribers for their kind patronage and wish them all a Happy New Year.

NEW PUBLICATIONS.

THE ANATOMY AND PATHOLOGY OF THE TEETH. By C. F. W. Bödecker, D.D.S., M.D.S. With three hundred and twenty-five illustrations. Adopted by the National Association of Dental Faculties as a text-book for dental students. Philadelphia: The S. S. White Dental Mfg. Co., Publishers, 1894. Price, Cloth \$5.00.

There is one word that alone attests more of the value and excellency of this work than anything we can say and that word is Bödecker. Dr. Bödecker has been a faithful worker in this line of investigation for many years and it will be a source of great satisfaction to the profession to be able to enjoy the results of this research, as given in the book before us.

At the beginning of the work the author states that "years ago he became so thoroughly imbued with the conviction of the correctness of the views of Dr. Carl Heitzman, that he resolved to study the tissues building up the teeth in the light of this novel doctrine." The views of Dr. Heitzman are directly antagonistic to the generally accepted cell theory. He maintains that a cell, or a lump of protoplasm, hitherto considered structureless, is possessed of a pronounced reticular structure. Since he had seen this reticulum in continuous changes of place and shape during the locomotions of living protoplasmic lumps, such as amœbæ, colorless blood corpuscles, etc., he called the substance which builds up the reticulum the living or the contractile matter proper. He designates as formations of living matter, the nucleus, the granules with their interconnecting threads, and an extremely thin layer, inclosing a lump of protoplasm all around. He holds, also, that the intercellular or basis substance of the connective tissue is not dead or inert, as hitherto supposed, but is alive in the same sense as the cells themselves. The reticulum of living

matter visible in the latter is present also in the basis substance, though rendered invisible by chemical changes and a solidification of the originally liquid contents of the meshes in the protoplasm. It has been proven that in all varieties of connective tissue, in the muscles, nerves, and the epithelia, the so-called cells are interconnected by means of delicate threads of living matter, or indirectly by the reticulum pervading the basis substance.

Dr. Bödecker asserts that the reason why the reticulum has not been more generally observed in protoplasm has been through the use of too low a power of the microscope. Instead of 450 diameters 800 to 1,000 are required for the study of the reticulum under consideration. Many of the tissues, from which engravings were made for this book, were magnified from 1,200 to 2,000 diameters.

We are inclined to the belief that with use of the higher powers of the microscope the views of Dr. Bödecker and Heitzman will be more generally accepted.

The author has enriched the work by the use of over three hundred engravings of a most excellent character, that were prepared expressly for the book. These illustrations elucidate the views of Dr. Heitzman and are, in themselves, of special interest.

The subject matter has been carefully prepared and is presented in a masterly manner, showing much original study and research. It is not a book to be hastily read and cast aside, but a book to be studied, read and reread. We believe that there are but few who can say, after reading it, that they have not been enlightened by its contents. There may be, perhaps, some statements that might be challenged, but who among us can write a book that is faultless? As a whole it is a most excellent treatise on this subject and should be in the library of every dentist. The publishers, also, deserve credit for the excellent press-work and general typographical appearance of the book.

A STANDARD DICTIONARY OF THE ENGLISH LANGUAGE. Prepared by more than Two Hundred Specialists and other Scholars under the supervision of Isaac K. Funk, D.D., Editor-in-Chief, Francis A. March, L.L.D., L.H.D., Consulting Editor, Daniel S. Gregory, D.D., Managing Editor. Associate Editors: S. D. Champlin, M.A., Rossiter Johnson, Ph.D., L.L.D., A. E.

Bostwick, Ph.D. New York : Funk and Wagnalls Co., 1894.
Vol. I. Price, Single Volume Edition, Full Russia, \$14.
Two Volume Edition, Full Russia, \$17.

Sold by subscription only.

This dictionary has been prepared upon original plans designed to give, in complete and accurate statement, in the light of the most recent advances in knowledge, and in the readiest form for popular use, the Orthography, Pronunciation, Meaning and Etymology of all the words and the meaning of idiomatic phrases in the speech and literature of the English speaking peoples.

Something of an idea of the comprehensiveness of this great work may be had by the statement that it is now nearly five years since this work was begun, and it has cost \$1,000,000.00. There were 247 office editors and specialists engaged in its production, and more than 500 readers for quotations, besides hundreds of other men and women who rendered effective service. .

The vocabulary is exceedingly rich and full, far exceeding that of any dictionary that has preceded it. In its 2,300 pages it contains 301,865 words and phrases, nearly $2\frac{1}{2}$ times the number of Webster's largest (International) dictionary, and upwards of 100,000 more than the famous six-volume Century Dictionary, which is selling for \$60.

The appendix to the Dictionary contains 47,468 words and phrases, making the complete vocabulary of the Standard Dictionary 349,333 terms.

The vocabulary of the Standard is not enlarged by the admission of worthless terms, nor is it padded with unimportant, obsolete words. The remarkable growth of the language in nearly all departments of science and literature in the past few years largely accounts for the wonderful increase in vocables. The Dictionary contains more than 4,000 new words and phrases in electricity and allied subjects alone.

The Standard is exceedingly rich in quotations.

The places of quotations used to verify or illustrate the meaning of words *have been so indicated that they can be found easily*—the name of the author and the title of the work, the volume, chapter, and page, and the name of the publisher and date of publication being given. This is a distinct gain to the student of words. It has been a Herculean task to select, locate, and verify

exactly the tens of thousands of quotations used in the Standard. Nearly 100,000 volumes were read for this purpose. Practically all English literature from Chaucer to the present has been ransacked for this purpose.

Another feature of special advantage is the use of the *Scientific Alphabet* in the respelling of the vocabulary words to indicate the pronunciation. The use of this alphabet, each letter of which represents a distinct sound, obviates the difficulty of endeavoring to master a great number of arbitrary symbols and diacritical marks, as is the case in attempting to master the pronunciation in other dictionaries. Prof. Francis A. Marsh, LL.D., L.H.D., of Lafayette College, who is recognized as one of the most eminent of living philologists, in both Europe and America, had charge of this department.

There are upward of 5,000 pictorial illustrations which have been made expressly for this work, a number of which are full-page illustrations, made by Prang and other leading lithographers, as *gems*, *national coats of arms*, *spectrum*, etc.; some of these were made under the supervision of the celebrated art experts, Tiffany & Co.

This dictionary is marvellously condensed. Groupings of words and the presence of tables are very noticeable. A word having found vocabulary place, is defined, beginning with its most usual sense and descending through the rarer significations to obsolete meanings.

Then come compounds and phrases, which being hung on the one recurring and generic element or term, are already half defined and require only the addition of the specific modification. There is a great saving of repetitious words and often a clear gain in sense, arising from the association of a compound word with the etymological origin of one of its parts. In some instances these groups run to more than a hundred words. From a professional point of view these groups of terms are most advantageous. In medical terms this work is exceedingly rich in matter and there is apparently no important thing in Dunglison, Bailey, or Foster, so far as that work has been carried, which may not be found in the *Standard*.

Another form of condensation which appears to be quite a novel feature in lexicographical art is the frequency of tables and analytical treatment of subjects. It is scarcely stretching words

to include the analysis of physiological and scientific subjects under tables, although this method is pursued so often as apparently to sink into a mere definition round. It is far more, for it opens the way to an extensive series of words which make the work Encyclopedic.

Thus *anthropology* is taken up in the widest theoretical sense through Eighteen Subdivisions stretching from somatology to history, and again on lines of purely inductive processes, embracing somatology, ethnology, ethnography and archæology. The same course is taken with biology, history and hundreds of comprehensive terms. But the tables most conspicuous are such as the enumeration of all the chemical elements, with the dates of their discovery, the laboratory origin, their atomic and specific weights, etc., of 500 coins and units of account of all nations for the whole historic period. The colors, as blue, crimson, green, etc., are tabulated through all their commercial forms, as pigments and dyes. A score of like tabulations are under our eye but there is no room to enumerate them. This is more than lexicography, it makes a general reference book.

The treatment of synonyms and antonyms is a characteristic feature of the Standard Dictionary. The purpose has been to bring out sharply the finer, nicer distinctions of words, especially with reference to correct established usage at the present day. Antonyms have the advantage of definition by contrast, and are often helpful to the clear and vigorous expression of contrasted or conflicting ideas which it is desired to state authentically.

We have given but a few of the important features of this grand work but enough to show its immensity. It stands out in bold relief far ahead of its competitors. It is *the Standard Dictionary* of the English language and its low price brings it within reach of all. No family, especially that of a professional man, can afford to be without this comprehensive work.

SOCIETIES.

THE OHIO STATE DENTAL SOCIETY.

THE meeting of this society, just held, was conceded to be the best since reorganization took place. Those who fail to attend these meetings miss more than they realize. The papers

and discussions were all good and the best of harmony prevailed. The attendance was unusually large, but should have been double what it was. Ohio dentists should take a special interest in their own state society and assist in making it one of the very best in the country.

At the meeting the following were elected to membership : Drs. James Silcott, Washington C. H. ; J. F. Stephan, Cleveland ; G. H. Woods, Mt. Sterling ; A. W. Jamison, Findlay ; J. W. Jackson, Jackson ; H. M. Chaney, London ; J. B. Snyder, Bryan.

The society is opposed to the means adopted by certain dental colleges to get so called "Beneficiary students," and passed the following resolution :

Resolved, That it is not the province of this, the Ohio State Dental Society, to endorse students for special favors in dental colleges.

Aside from the clinics and exhibits at the meeting there were many new things presented by the dental dealers, some of which were : The Custer fan, made to attach to the fountain cuspador, and propelled by water power.

The Waldron water motor, for running engine or lathe, and the Waldron engine hand-piece, that can be instantly stopped or started, attracted much attention and favorable comment. The Land coal-oil furnace, for porcelain work, came in also for its share of praise. Other inventions were also displayed.

The officers elected for the ensuing year were :

President, W. H. Todd, Columbus.

1st Vice President, Henry Barnes, Cleveland.

2d Vice President, L. E. Custer, Dayton.

Secretary, L. P. Bethel, Kent.

Ass't Secretary, G. Molyneaux, Cincinnati.

Treasurer, C. I. Keely, Hamilton.

BOARD OF DIRECTORS, 3 YEARS :

C. H. Harroun, J. A. Lupton, W. H. Hague, J. Taft.

CLEVELAND DENTAL SOCIETY.

THE officers elected for the ensuing year are : President, J. R. Bell ; V. Pres., G. H. Wilson ; Sec'y, J. F. Stephan ; Treas., Ira Brown.

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CONTRIBUTIONS.

THE SMALL PORCELAIN FURNACE, INCIDENTALLY.

BY GRANT MITCHELL, D.D.S., CANTON, O.

MASTER W—— in playing foot-ball had the left superior central and lateral incisors broken off near the gum. The central was a square break and presented no difficulties to a crowning operation. The lateral, however, was broken diagonally, from the line of the gum, labially, to a depth of quite a quarter of an inch on the palatal side.

A Logan crown of suitable shade was selected and ground to fit the labial portion of the root. A piece of very thin platinum foil, annealed at white heat for several minutes, was pressed over the broken off crown (which, fortunately, had been saved) and trimmed to exact shape; this was then transferred to the root and carefully punctured for the insertion of the dowel post. A small piece of pink paraffine and wax was next worked between the thumb and fingers until it became softened by the warmth of the hand, then placed around pin of the crown which was immediately inserted through the opening in the platinum into the root and firmly pressed into its correct position. After waiting

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a moment for the wax to harden somewhat, the crown was carefully removed, together with the wax and foil, and invested in plaster and powdered silex (eq. pts.) in such a manner as to retain the exact relation between foil and crown after the wax was washed out with boiling water. The space, then, between foil and crown was filled, little by little, with Downie's Porcelain Enamel and baked, requiring three bakings. The result is shown at Fig. 2. I have successfully resorted to this method in crowning badly broken down roots, during the past eighteen months, in more than a dozen cases.

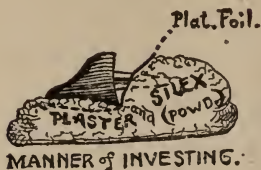


Fig. 2.

Another use to which I put my little furnace with results alike gratifying to my patients and self, is in the matter of retaining appliances.

After the teeth have been regulated, make the retaining bands of platinum plate of suitable gauge, solder with pure gold, coat the labial surface with properly shaded enamel and bake.

As these appliances usually have to be worn a year, more or less, you can hardly estimate the measure of appreciation on the part of those on whom this little extra(?) attention is bestowed. I have experienced no trouble by "scaling off" in the several cases which I have used this.

THE USE OF SULFURIC ACID IN THE TREATMENT OF ROOTS FOR IMMEDIATE FILLING.*

BY CHAS. WELCH, D.D.S., WILMINGTON, O.

LAST year I was accused of bathing in sulfuric acid, which I deny, but every nerve canal that is treated by me, is bathed in it.

You want to know of my success? Under what conditions to expect a failure? How many I have treated? Manner of treatment? What teeth they were? Age of patients? What is accomplished in the way of cleansing, and in the stopping of

* Read before the Ohio State Dental Society, December, 1894.

hemorrhage? Is there any danger in allowing the acid to go through the apical foramen?

You remember Dr. Callahan's most able paper on this subject at our last meeting. He recommended the use of sulfuric acid in the opening of difficult root canals, but for straight and unobstructed ones used the "Gates-Glidden drill." We now, after a year's successful experience, use the sulfuric acid in every case. Thanking Dr. Callahan for the first thought or suggestion of this most useful aid to the profession.

Since Dec. 11th, 1893, I have treated 103 cases, and strange though it may seem, have been successful in every one of them. I filled every tooth immediately after using the acid fifty per cent. aqueous solution, excepting in cases of blind abscess with pus in the root canal. In those cases, after having cleansed the canal with acid, fill it with glycerin and iodoform made into a thick paste, leave in a week, then remove, and fill permanently. That is the only condition I have found, that you can not fill immediately. I have used this treatment upon every tooth in the mouth without an exception, as a matter of experiment. Ages of patients ranging from fourteen to seventy-five years. Under every condition from a recently extracted live pulp to a chronic abscessed tooth.

In cases of hemorrhage in root canals, sulfuric acid will always check it, so you can fill immediately.

My manner of treatment is: First apply the rubber dam. Open the pulp chamber freely, take with pliers a pledget of cotton, soak in sulfuric acid and place it into the chamber. With a No. 5 Donaldson Canal Cleanser pump the acid into the canal to the apex of the root. You may know when you have reached the apex by the patient complaining of pain. No trouble will arise by the acid going through the foramen. You know how dangerous it is to force a nerve broach through the foramen of any devitalized tooth, how soon you will have an alveolar abscess, but by using sulfuric acid, first on a pledget of cotton, it precedes the canal cleanser, and kills bacteria, preventing this trouble.

Second. With a drop tube flood the chamber with a saturated solution of bicarbonate of soda, which by the formation of carbonic acid gas throws out the debris, neutralizing the acid, at the same time cleanses and apparently whitens the tooth. Then dry thoroughly with a five per cent. solution of pyrozone followed with hot air.

Third. With a minim syringe flood the canal with carbolic acid and iodine, equal parts; followed with iodoform and glycerin which I force through the root. Then use chlora-percha with a gutta-percha point, which finishes the treatment, and the tooth is ready for a permanent filling.

DISCUSSION.

DR. J. R. CALLAHAN: Dr. Welch goes a little beyond anything I have written on this subject when he gives details of after-treatment. That the treatment he announces has been successful in his hands is abundantly proven by the number of successful cases he reports. Although he does not mention the fact I know that he has an accurate record of each and every one of the 103 cases that he reports. I thought at one time, of having a large number of record cases reported at this meeting, but a friend and neighbor of mine talked me out of that idea, which perhaps was well enough for Dr. Welch's record is sufficient, and it might be interesting to some of you to look it over.

I am often asked if I allow the acid to go through the foramen. My answer to this is that I *try* to get the acid through in every case. Of course I go very carefully. You should not ram the broach through the foramen as if you were drilling a hole in a solid rock; nor should you stab the instrument into the membranes beyond the root. With the *broach* you might do harm. The acid attacks vital tissue very mildly, but with devitalized tissue the attack is prompt and vigorous, so if the tissues about the apical space are in their normal condition the presence of the small amount of acid that gets through the canal will create no disturbance further than a slight irritation which will pass off in a very short time if you will prevent its becoming inoculated by the introduction of septic matter. If there be pus present you will do well to flood the pus pocket with the acid solution.

A word of caution. When working in small canals always take a new broach and keep in mind that the acid makes the broach quite brittle.

After the root canals have been filled be sure to trim the margins of the cavity; that is cut away all the borders of the cavity that *might* have been touched by the acid, you need not cut deep, just enough to get a fresh surface for contact with the filling.

There is another thing I want to mention while on my feet, in cases of chronic abscess where it is necessary to amputate a portion of the root and remove dead bone. This operation leaves quite a chamber in the jaw that is often left to heal the best it can. This I believe to be wrong. This cavity should be packed full with iodoform gauze, and the gauze

renewed at intervals of 24 to 48 hours, using a little less of the gauze at each visit. This is an old and established surgical practice.

Dr. O. N. Heise directed my attention to this after-treatment. Why it has been so generally overlooked is much more than I can tell.

DR. H. A. SMITH: This discussion recalls the mineral acid theory of dental caries as taught us years ago by Professor George Watt.

He described three varieties of caries; one of which he claimed, was caused by sulphuric acid. By this acid the organic portion of the tooth is slowly carbonized, giving rise to what Professor Watt termed the black variety of dental caries. Accepting this theory as correct for the time, may we not produce by the use of sulphuric acid in root canal treatment artificial caries of Professor Watt's second variety?

Dr. Welch uses sulfuric acid in treating all root canals, whether septic or antiseptic. If the acid is used in foul root canals, may not a double purpose be effected? The canals would be widened by solution of the lime salts, and at the same time, the basis substance of the dentine, together with any micro-organisms present, would be burned and carbonized.

Perhaps the very general success which Doctor Welch claims has attended the use of sulfuric acid in putrefactive root canals, and in cases of abscessed teeth may be explained upon the hypothesis mentioned. It will be observed that in some of the cases reported by Doctor Welch, as cured by the sulfuric treatment, other well known antiseptics were used in connection with the acid. We are therefore left in doubt as to the real efficiency of this remedy, at least so far as these cases are concerned.

DR. HARROUN: Sulfuric acid is on record as the favorite treatment of Dr. W. H. Atkinson in all cases of necrosis, and it is no new treatment so far as cleansing the tissues from such deposits is concerned. He used to tell us to use a quantity of vitriol, and not to be afraid of it, as it would break down necrosis deposits. I have always made use of the aromatic sulfuric acid in such treatments.

DR. HOFF: What has just been said about the use of elixir of vitriol is liable to lead us to confound this agent with dilute sulfuric acid, and cause confusion in results obtained. Elixir of vitriol is a twenty per cent. alcoholic solution of sulfuric acid and has no great powers as a solvent of bone or soft tissues. This point was very satisfactorily settled by Dr. J. N. Farrar by a series of experiments recorded in the *Dental Cosmos* for 1878.

I see no special advantage in using the dilute sulfuric acid, in the treatment of decomposed pulps in the pulp chambers. It seems to me there are other agents which will just as effectively accomplish the

removal of the dead soft tissues and which have no objectionable qualities. Hot water is preferable, especially if a little soda and some good antiseptic be added. It is less objectionable as it will not injure living tissues, the instruments or patient's clothing should an accident occur. Therefore, as a simple detergent I would not make use of the sulfuric acid in such cases, I can however see no valid objection to one using the dilute sulfuric acid as a sterilizing agent and detergent if proper precautions are taken to protect the other tissues from its caustic properties.

Sulfuric acid is a cauterant and is decomposed in the presence of water liberating oxygen, which destroys the molecular affinities of organized tissues. It is very active in destroying calcified tissues as well as soft tissues, I would use it in the treatment of pulpless teeth not primarily as a sterilizing agent, but as a detergent in a sense, that is to destroy the remains of the pulp organ and so much of the calcified tissues as was desirable to enlarge the pulp canal for free access.

My experience with it has been rather unfavorable. In one case I attempted to use it in the same way these gentlemen have, but after destroying the pulp I couldn't remove it by ordinary detergents. A case in which I used it was one in which there was a large amount of bone deposited. The canal was almost entirely filled up and I couldn't remove the pulp by the usual proceedings. It was very much irritated and inflamed and I had much difficulty in trying to remove it. I injected cocain so I could do almost anything I cared to. The only way I could get at it was to drill it out. I undertook the sulfuric acid treatment and succeeded in enlarging the canal and removing the pulp entirely. I afterwards inserted a crown, and ever since the tooth has been giving trouble. There is no inflammation of the peridental membrane, but there is very much pain about the tooth. On testing it thoroughly I am satisfied there is no inflammation about the tooth but an irritated condition. I don't know whether it is due to treatment with sulfuric acid or not. It sometimes occurs to me possibly it is. I am certain I did not encroach on the peridental membrane. I am very sure I did encroach upon the cementum and I can't account for it in that way. The absence of inflammation puzzles me a great deal about that tooth.

In regard to antiseptics following it, I think it is very good practice. I would use them for the reason that the sulfuric acid soon becomes diluted, although it may be an antiseptic and germicide in its active form.

In its undiluted form it is dissipated very quickly because it is soluble in water and the fluids of the tissues. I think Dr. Welch's practice of using aristol is commendable, because it is not so quickly dissolved, remains a long time, giving the tissues a chance to recuperate under non-irritant antiseptic conditions.

SOME PECULIARITIES OF OXYPHOSPHATES.*

BY W. V. B. AMES, CHICAGO, ILL.

MR. PRESIDENT: I did not understand until I came here that I was on the program for a paper. I think that I wrote Dr. Callahan of how much pleasure it would afford me to be here and that I would show some peculiarities of oxyphosphates and I was put on the program for a paper. I do not care to take up the time of the association since you have in store the valuable matter of Dr. Molyneax and others. I have been doing a great deal of experimenting with oxyphosphate for several years, but I will only call your attention to what I have been able to produce in the way of a phosphoric acid solution which is crystallized in such a form that it can be used as so much liquid and remedies the difficulty which we so often experience from having the liquid of a cement partially crystallize before it is used up. By reason of the form of crystal in my material there is a pasty consistency which is uniform throughout and will not undergo any change from long keeping. I have here also specimens of hardened cement which show greater density and closer texture than we have been familiar with in these materials.

DR. H. A. SMITH: How is it as to solubility in the saliva?

DR. AMES: I have seen it hold contour for two years in an approximal cavity in a way that I never have in other materials of this kind.

DR. —: What dissolves the phosphates?

DR. AMES: When an oxyphosphate dissolves it is either because there is not proper union or crystallization, or that there is too much soluble alkaline phosphate cement contained in the mass. Of course the surface exposed to mastication will with most cements be worn away; but I believe that a great deal of failure at the cervical margin that is blamed upon the cement is in a large majority of cases the result of faulty manipulation of an undesirable cement. A cement has been used which will adhere tenaciously to a dry surface but not at all to one that is slightly moist. The cervical margin may have been well prepared and made fairly dry, but if there is a trace of moisture

*A Talk given at the Ohio State Dental Society, Dec., 1894.

there the cement will be very prone to draw away during the packing or the trimming of the filling. Then of necessity there is failure at the cervical margin. The cements containing soluble alkaline phosphates are the ones which are most apt to behave in this way, therefore they are not best adapted for filling but rather for crown setting. I do not believe that any one cement can be used to advantage for all purposes. We need cement of one quality for filling and of another for setting crowns.

According to my belief and observation, a cement that best answers the purpose of filling is one in the composition of which there are no soluble alkalies. Such a cement mixed as stiff as can be for filling, incorporating as much powder as is practicable, will still have a slight acid taste while plastic, but no taste after proper crystallization. Such a cement mixed thin enough for crown setting would be in improper condition because enough acid would probably dissolve out to leave a friable mass. When we need extreme plasticity we had better use a cement containing alkaline phosphates which give this plasticity as well as rendering the cement less irritant which is desirable in crown setting and for cavity lining usually. Such a cement placed under a metallic filling or within a crown can, I believe, be relied upon; whereas, if used for filling purposes independently it would be unreliable.

DR. BETHEL: What is your method for mixing cements?

DR. AMES: I believe in mixing more energetically than many do. I want a large stiff spatula and large mixing surface. There is a spatula made by the Boston Dental Mfg. Co., their number seven which suits me better than any other which I can buy. As I use my filling cement I mix it as stiff as I can upon the slab adding the powder gradually and rubbing energetically, gather it up and knead it between the thumb and finger rigorously, incorporating more powder as long as the mass tends to become soft and sticky. After it ceases to take up powder readily there will be sufficient plasticity for packing. In this way I got the best results, getting such density of material as you will see in the specimens passed about. The best of the foreign cements can be worked in this way. There has been a sort of controversy as to whether we should mix cement on a chilled slab or not. Dr. Knapp of New Orleans once took exceptions to the statement of Dr. Evans of New York that there was an

advantage to be gained by mixing the cement on a bottle filled with cold water. Now while this is a good practice in New York during the major portion of the year, it is a practice not well adapted to the atmospheric conditions prevailing at New Orleans where the condensation of moisture would be such as to seriously damage the cement. There is no doubt but that here in the north during the winter months when the air is comparatively free from moisture, we can use such a chilled surface to advantage and do better cement operations than during the summer months when the use of the chilled slab is not practicable.

DR. —: What cement do you use?

DR. AMES: In my practice I use almost entirely that which I produce myself. For crown setting and all work where a non-irritant cement is called for, I use what I have been able to produce which resembles more nearly the Excelsior of Ash & Sons than any other. The main difference depends upon my powder which gives a glossy and close texture. For fillings I use about the same powder with the pasty acid which has been exhibited.

DR. TAFT: This is a subject of very great interest and I think we all realize that a plastic filling of this kind is very desirable. We find a preparation of this kind behaving differently in different cases, and I am hardly able to discover whether that is the result of the material itself—it is at least in many cases—or how much it is dependent on the solvent power of the saliva in different mouths. You find some fillings many times that have been for many years in the mouth and seem to be as perfect as when put in. Not long ago I saw a filling in a proximate cavity in the incisor put in several years ago and there was no wear at all. In others you put in some filling and it wears out in a short time. Frequently when put into a proximate cavity, when it gets in the gum, how often it is undermined and the cement worn out at the cervical portion of the cavity and the rest remains in good condition. That could not be on account of the peculiar condition of the cement, it seems to me, but because a solvent is secreted by the mucous membrane. It may be it was not properly introduced.

DR. —: What is it that destroys it there?

DR. TAFT: It is an acid of the saliva. It has got through there more rapidly than any place else. I have longed to find the cement that will serve this purpose best and have not been

able to find it. It is a line that ought to be investigated. Investigation should be made in regard to the quality of material and the reliance that can be put upon it for the various purposes for which it is used. In the mouths of some persons cement won't wear any length of time exposed to the secretions of the mouth, and I think the mucus is a more active solvent than the saliva proper. A desirable point is to gain a knowledge of the best material that will be reliable and its behavior be uniform. Different cements behave differently under different circumstances. Sometimes they are easily manipulated and sometimes not easily manipulated. These variations I am not able to account for.

I suppose the experiments of Dr. Ames are with a view of settling these questions. I think he can help us settle them. I think he has experimented more extensively than anybody else.

DR. SILLITO to Ames: Do the liquids crystallize on account of evaporation?

DR. AMES: The matter of crystallization of cement liquids is not necessarily a matter of absorption or giving up or moisture. A certain solution may remain in the liquid state for a considerable time and then begin to crystallize from the effects even of a sudden jar, but more likely because of there being placed within it some nucleus about which the crystals will readily form. Such a nucleus is easily introduced by means of the spatula or whatever is used in transferring the liquid from the bottle to the mixing surface. With many of the liquids crystallization can be avoided by dropping from the bottle instead of inserting spatulas, etc., within the bottle. My main object in speaking to this extent, Mr. President, is not to advertise my materials as it may seem, but to impress upon the members my conviction that a great deal of good can be accomplished by the use of the proper cements in a differential way. If a man tells me he does not believe in cements for filling purposes and then tells me that he uses certain materials I might mention, I say of course they will not stand. They might do for setting crowns but I would not make a filling of them. If you use such a cement as the Harvard, or Dirigo, or Globe, or Concrete, or Eisefelder's, a very useful filling can be made.

DR. SMITH asks whether an acid or alkaline condition is more destructive to cements. I cannot venture to say what the result would be with faulty material. I can only say that I believe

that with material properly compounded and properly manipulated there will be no solution but only more or less wearing away of the most exposed surface.

Dr. Smith and then Dr. Taft asked Dr. Ames to mention the names of three or four cements that he considered the best.

DR. AMES: I mentioned that the cement which I use for crown setting resembles the Excelsior of Ash & Sons which I regard as very satisfactory for this purpose. It is well thought of by the men in New York and Philadelphia whom we best know. I have mentioned the Harvard, Dirigo, Concrete, Globe, Eisefelder's, and I might include some other German preparations possibly for satisfactory filling cements. What I use myself I term Ames' Metalloid, which if worked as I have recommended gives satisfaction. After mixing it as I advised and packing it into the cavity, I work more powder into the surface as it is being shaped up. As the filling has the desired contour, rub the surface down with a pellet of cotton or some such material which is *very slightly* moistened, as you get by moistening a pellet and squeezing between dry surfaces of napkin. By means of this slightly moistened pellet the surface can be smoothed and this slight moisture is an advantage with the cement which I use for fillings. If I have plenty of time to allow the filling to harden while I am making some other operation, I would work it down to the proper contour as nearly as possible and use the moistened pellet just before removing the rubber-dam. I use a matrix wherever practicable so as to facilitate the packing and finishing.

DR. SILLITO: I notice that the Dirigo cement is more lasting if you allow the central portion of the filling to bulge.

DR. AMES: I have not used it enough to learn that. I will say in this connection that there is in the Dirigo a considerable portion of an antiseptic which is unmistakably hydronapthol. I do not believe that any advantage is gained by incorporating such an antiseptic with a cement. I believe that it detracts from the density and wearing qualities and does not exert any valuable antiseptic influence.

DR. —: There is one cement you have not mentioned, namely, Brittons.

DR. AMES: I would rather use Excelsior than Brittons. I believe it is equally serviceable and much pleasanter to manipulate.

HARMONY.*

BY H. L. AMBLER, D.D.S., M.D., CLEVELAND, O.

THE poet says; "There is a bond which holds each cord in harmony." Can we find that bond? The practice of dentistry can never be separated from the human anatomy, thus the connection between dentistry and medicine must always be an intimate one, and both callings only exist in consequence of the ills to which the flesh is heir. "The true professional spirit is one of generosity," and if applied in cooperation and interchange of professional thought between M.D. and D.D.S., advancement for each will certainly result. Neither should try to be completely independent of the other, for all things being equal, the M.D. and D.D.S. who agree to rely upon and assist each other will be successful in curing many cases, where alone, either one would have failed. One result of consultation will be, to alter their ideas and relations to each other, and also greatly aid in relieving suffering humanity. Cooperation, working together, and exchange of knowledge, should be in private practice and before medical and dental societies. In the writings of Hippocrates, Galen, and Celsus, medicine, surgery and dentistry were all included, and history informs us that the ancient Egyptian surgeons, physicians and dentists, worked in harmony. Their united efforts have furnished such an accumulation of knowledge, that the work has been to a great extent classified and apportioned to each one, but this does not furnish sufficient and proper grounds for them to ignore each other. Harmony and mutual interest can be attained by closer association, for we are dependent upon the physician, and he is dependent upon us. Medicine, or dentistry, cannot be productive of as much good, as when reasonably combined. If a dentist has no medical education, cases will occur in his practice, which could sooner and easier be cured by consulting with an M.D. When a patient comes to you with a syphilitic, or any other lesion of the mouth which you fail to diagnose, it is much better for the patient, and more to your credit to consult with an M.D. and have the proper treatment administered, than for you to prescribe a remedy or operation, the result of which you could

* Read before the Ohio State Dental Society, December, 1894.

only imagine. Here the M.D. might be able to give a correct prognosis, foreseeing what results would follow from a certain course of treatment. The M.D. should act in the same manner with his patients, for he comes to the dentist very quickly when he cannot cure his *own* toothache. As a general thing, when dental diseases—so called—are discussed by physicians, or medical diseases—so called—are discussed by dentists, it is shown that there is lack of knowledge by each party. There are M.D.'s who have given attention to some dental lesions, and there are dentists who have devoted study to some medical lesions, but they would be an exception to the foregoing statement. Only seven or eight medical colleges in the U. S. give any special attention to the teeth and their diseases, so that lack of technical knowledge, makes the physician sometimes mistake effects for causes when the disease is of dental origin, thus suffering is prolonged, and occasionally death results. The *Lancet* reports a case, viz: A patient was brought to a London hospital, in a weakened condition with an abscess on the neck, and after being treated a very short time died. At the post mortem the surgeon testified that death resulted from gangrene of the lungs and exhaustion from the effects of extending alveolar abscess, followed by pyæmia, which was produced by an ulcerated tooth.

The M.D. who can contribute to the fund of dental knowledge, is the one who should be heartily welcomed at all times, and it is a duty we owe to ourselves and patients to learn all the good things we can from everybody, as our profession is one in which no scientific attainment is too great to be made use of. 'By joining hands with the M.D. we can hope for better things, which will raise us from the age of selfishness, and place us upon an eminence which will enable us to derive light from all the bright luminaries which adorn the profession.'

Some of the publications of the International Medical Congress and the American Medical Association, are read with pleasure and profit by dentists, and some essays in dental journals we trust would be of assistance to the busy physician or surgeon. M.D.'s read essays before dental societies; we had the pleasure of listening to one at our last meeting, and dentists do the same before medical societies; still there is not enough of this kind of interchange, much more of it would bring about a better understanding. Neither individuals nor societies should place any bar-

riers between the M.D. and D.D.S., for the time has come when neither can afford to disparage the other, and the sooner they come to this conclusion, the better for both. "Many times surgeons and dentists have to seek the assistance of each other in order to effect cures. Sometimes the dentist has to prepare the way for the surgeon's knife, and in other cases the dentist has to aid the surgeon by a mechanical appliance. It is no reflection upon the most skillful and distinguished surgeons to say that they ought in many cases to seek the aid of the dentist and his mechanisms to supplement their services in the interests of patients." The gratifying results which have been thus accomplished, have been well demonstrated in numerous cases. In the restoration of lost portions of either maxilla, whether from disease or surgical operation, the surgeon is quite ready to call in the skill of the dentist to construct some appliance which will remedy the deficiency, restore symmetry and usefulness. E. H. Angle, D.D.S. of Minneapolis, has been appointed surgeon to the Great Northern R. R. to treat all cases of fractured maxillæ. If for any reason staphylography is a failure, the dentist can give relief and comfort to the patient, by making them an obturator.

Infantile dentition is more or less a factor in fever, diarrhoea, enteritis, obstinate vomiting, spasmodic coughing and convulsions; in such cases we suggest that consultation might be of advantage, for sometimes tumefaction of the gums and local disturbances are not very well marked. The teeth and the mucous membrane of the mouth are so closely related to the pharynx, esophagus, and intestines, that there is no reason why they should not cause disease. Those who have not made it a study cannot be expected to fully understand about the changes which are taking place during dentition, but from a scientific knowledge of the tissues with which the professional man comes in contact, he derives the art of producing in them health or disease. All will be ready enough to admit, that the more one knows of any and all organs of the human subject, the easier it will be for them to meet the formidable array of complicated diseases which may be presented.

Those who are too erudite to ever find anything new in the unlimited field of medicine or dentistry, should soon be called to a higher sphere, where they *may* have room for boundless expansion. Sometimes we find otalgia produced by reflex irritation of the dental nerves.

The important vascular and nervous ties binding together teeth and eyes, show clearly enough that a certain pathological relationship between those organs is no more than might be expected ; while the knowledge we possess concerning reflex affections in other parts of the body must incline us to a belief in the reality of such a connection. Examination of the teeth should never be neglected in treatment of diseases of the eye, and the removal of any morbid dental condition should always be aimed at. Gazelowsky claims that the following diseases stand in casual connection with carious teeth ; reflex asthenopia, closely related to caries of the anterior molars, inflammation of the cornea, iris, and of the inner membranes, through the transmission of a " kind of ascending neuritis" by the ciliary nerves, irido-chorioditis, reflex dilatation of the pupil, blepharospasmus and cramp of the ocular muscles, exophthalmus from transmission of inflammation through the maxillary sinus. The symptoms of keratitis or conjunctivitis, that appear suddenly in childhood, are often due to difficult dentition. Dr. Williams reported the following case in the *Dental Cosmos*: An alveolar abscess from a superior molar, discharged on the lower margin of the orbit, under the outer commissure of the eyelid. The pus had burrowed under the zygomatic process and temporal muscle and was prevented from pointing in the temple not only by those structures, but also by the strong temporal fascia. It had then passed through the speno-maxillary fissure into the outer and lower part of the orbit, to discharge by means of a fistulous opening in the location described. Distinctly marked exophthalmus of the eye was present, along with serous chemosis of the conjunctiva. After the pus had been evacuated by means of an incision in the temporal region, improvement immediately followed.

Some forms of nasal disease have been traced to diseased teeth, and as regards antral disease, it is only necessary to mention the fact, admitted by all, that many serious cases have been cured by the removal of one or more diseased teeth or roots. Chorea, hysteria, epilepsy, paraplegia, and insanity, have been caused by dental irritation and disease. "The fact has long been established, that there is great sympathy between the eyes, stomach, brain, teeth, and the nervous system, and the pathological reactions when the teeth and oral cavity are in a diseased condition, calls loudly to the understanding of these conditions by any

who attempt to treat them." It has been said that every inspiration of a person with a diseased mouth, carries septic matter to the lungs and in time might cause death. "The symptoms and treatment of the morbid conditions of the teeth themselves, and of the parts immediately in connection with them, are not satisfactorily managed by the M. D., and seldom does the D. D. S. properly treat remote nervous affections in various parts of the body, or constitutional derangements arising from these local causes; diagnosis is often difficult, but often possible between those affections which *are*, and other very similar ones which can not be traced. "Both dentistry and medicine are needed for the relief of physical suffering and the prevention of disease, and such results can be best reached in certain cases, in proportion as dentist and physician are willing to consult and cooperate, for their work certainly overlaps." The minimum time required to graduate a physician is three years, and the same time is required of the dentist, so there must be considerable to dentistry after all. There can be no doubt if medical colleges would have their students study dental anatomy, pathology, etc., they would be able to diagnose and cure many cases in which they now fail. Sometimes an ulcerated tooth is diagnosed by physicians as a tumor, and is treated systemically, and perhaps locally until it points externally on the face or neck. "That living and dead tissue can be made to exist in the same organ in the system, without presenting to the patient or practitioner any special pathological condition, is an achievement in medical and surgical practice of which the dentists have a right to be proud."

Conservatism says that "a diseased part which can be restored to a healthy condition must not be sacrificed, thus if the exposed or putrid pulp of a tooth is a disturbing element, the tooth need not be extracted." Small things, because of their size, are often unrecognized and their proper treatment overlooked, but they sometimes lead to the most confusing complications. A large tumor readily detected by any one requires far less learning to understand as a cause of suffering than does an apparently causeless pain which is finally shown to have been reflected by the sympathetic nervous system from a distant point of irritation.

Prof. G. L. Curtis, the oral surgeon, says: "Among the causes of affections of the antrum, the teeth and their diseases stand first. The root of a tooth may merely penetrate, or it may

extend into the antrum half of its length with only the the mucous membrane intervening, if the pulp of such a tooth becomes putrid, the poisonous influence soon extends to the surrounding tissue. There is no resistance as when the root is enveloped in bone, consequently soreness of the tooth, one of the first symptoms of pericemental inflammation, may not be present. The nervous system is under a continuous strain where a purulent condition of the antrum exists.

In two cases recently observed, one of the patients had shown marked symptoms of insanity, and the other was insane for three months of the twelve for several years prior to operation. Fistulous openings under the chin, on the neck, back, and breast, have been caused by teeth containing dead putrid pulps. After two years treatment for rheumatism of the left shoulder, the cause was found in an abscessed molar, which was treated and filled, when the pain subsided. By extracting the diseased root of a superior third molar, paralysis of that side of the face was cured.

In a case of epilepsy which had been treated by different ones, it was found that the primary cause was four *badly* decayed teeth, two of them ulcerated, and two with exposed pulps, for this reason there was a great drain upon the system, and a continual nervous strain, and the food not being properly masticated indigestion brought on the attacks of epilepsy. These cases show in what diverse directions reflexes from the teeth may ramify."

The medical profession has justly been jealous of their good repute, and are trying to live up to a higher standard of scientific attainment. If we are honest, and possess good professional ability, the medical profession will be glad to clasp hands with us, as any calling which makes itself worthy of recognition, is sure to be recognized. If a dentist wishes to succeed well, he must understand to a reasonable extent the workings of the whole human system, and the more he knows of its different functions, the better he will be able to diagnose correctly, the diseases with which he comes in contact, thus from the supposition that he is learned in his professional specialty, it becomes his duty to himself and patients, to study and develop his powers in the general branches of medicine; without these acquirements, he has not done "his highest" in developing by brain and hand-work those powers which give him the strength to withstand the test of time.

Ought not the M.D. to have a fair comprehension of the teeth and their diseases? They are vitalized structures, supplied with arteries, veins, and nerves, and through these nerves are connected in sympathy with all parts of the body. He should be able to relieve an aching tooth without resorting to extraction, but in saving the precious organ add to his fame by preserving the health, beauty and comfort of those who seek his counsel. Do not extract any tooth which causes pain, whether decayed or not, but remember where the permanent teeth are removed, they do not appear again; nature does not, as in many parts of the body, supply the chasm which has been made. The temporary teeth are often extracted too soon, and they are sometimes mistaken for permanent ones by those who have had no training in dental anatomy; there is a duty and responsibility in these matters which ought not to be misunderstood. It is our belief that the most successful physicians, are those who have made the teeth somewhat of a study, and when called to a case examine them carefully should there be the least cause to suspect their implication. At the September meeting of the Odontological Society of London, England, the point was raised as to the advisability of the medical council making it compulsory that every medical man should know something about the anatomy, physiology and thology of the teeth. They also recommended consultation between physician and dentist, and suggested an interchange, by reading papers before medical and dental societies. One gentleman present, an assistant surgeon to a general hospital, said he often found it desirable to consult with a dentist in regard to cases under his care. When a patient, who is wearing the ordinary rubber plate, complains to the physician of continual sore mouth, throat, or indigestion, it would be well for him to have a consultation with the dentist. Take a case of neuralgia of the fifth pair of nerves and generally the pain is located in the temple, cheek, mouth, jaws and teeth. Now point out the M.D. who diagnoses these cases properly and cures the greatest number, and we can tell to a certainty that he is one who does not fail to examine closely the mouth and teeth; he knows that pericementitis arising from whatever cause, produces a very painful type of this disease; also that carious teeth are among the most prominent causes, and should receive his first attention, and he will almost invariably find them or their surrounding tissues in a dis-

eased condition. The ideas we have given are practical and should tend to bring the M.D. and D.D.S. into a closer relationship of harmony. Let each be ready to assist the other in consultation or operation, and not regard any with jealousy, or as rivals, but work together for the good of all humanity, for with such friendly feelings in your heart, success will in time surely crown your efforts.

DISCUSSION.

DR. C. R. BUTLER, Cleveland: It is hardly necessary to add any more about the necessity or the advantage, in the practice of dentistry, of having a knowledge so that when we come in contact with other members of the general profession, we will be able to discuss physiologically and pathologically the question of therapeutics in an intelligent manner, especially in consultation where it is deemed advisable and advantageous.

One of the difficulties that has presented itself to my mind has been the lack, perhaps, of self assertion on the part of those who engage in the practice of dentistry when they come in contact or association with those in the practice of general medicine, and they are disposed, perhaps, to take a back seat, or rather feel that they are not entitled to an opinion that is of just as much value as the men engaged in the general practice of medicine or any other specialty of the profession. There is no good reason why there should be any discrimination or recrimination between the two professions. We are all dependent upon one another and the part that is engaged in the practice of medicine or any other specialty, if they get into trouble, they go to the dentist the same as we go to the general surgeon. If we are in trouble we seek the assistance of those who can help us out. If the physician has a pain in face or teeth he is not able to fathom, he will come to the dentist just as quick as the layman, and in this way there is the very best reason why there should be a degree of harmony and no disharmony with one who is carrying on practice in a different field from the one in which we are engaged. I think there is more of this disposition being shown all the way around—that is my experience and observation and I think many here can voice the same thing.

DR. H. A. SMITH, Cincinnati: I am very glad to commend the paper for it is a very interesting one. The tenor of the paper indicates that there is disharmony between the medicine man and the tooth carpenter. I don't think it obtains very much between intelligent physicians and intelligent dentists. I think they are getting nearer together. Almost weekly we have patients referred to us by intelligent, bright physicians. It is no indication that they know nothing about dentistry them-

selves. On the other hand we get cases we know nothing about and refer them to the physician. I have no degree of M.D., which qualifies a man to practice medicine, and I am not going to raise the question whether it is necessary to have the M.D. degree, but I would rather be a qualified man as a D.D.S. than to be a cross between them; one of those double breasted fellows. (Laughter.) Does the degree of M.D. stand for anything? There are many dentists who have the degree who don't deserve it very much. We should settle these questions among ourselves. M.D. means, from the medical standpoint, doctor of medicine. Long ago, in a discussion, Dr. —, of Chicago, said the degree M.D. would be sufficient to stand for all. I advocate that we should have both degrees and have harmony between the dentists and medical men.

I do not quite agree that there is this remarkable degree of want of harmony between the intelligent physician and the intelligent dentist.

DR. HENRY BARNES, Cleveland: I agree that there is not so much want of harmony as formerly between the two professions. I frequently meet medical gentlemen in consultation in relation to certain cases, neuralgia, and others of a similar kind.

The other day I saw a case and it is worth while to describe it, because we hear so much about painless dentistry. I had heard from time to time of a certain lady who said she went to a distant city to have her dentistry done because it was painless. The case fell into the hands of a physician. She was troubled with severe neuralgia and he referred her to me to see if anything was wrong with her teeth. The mouth presented one of the worst cases I had ever seen. It certainly was not painless when I saw her. The trouble arose from an exposed nerve of the third superior molar which was extruded. I have not seen the patient since but am sure the pain was lessened very materially, although there was enough other trouble in the mouth to have caused neuralgia. The teeth had evidently been scooped out saucer shape and a great deal of cement put in. I will give you an illustration of how it had been done. The second superior bicuspid was broken down on its mesial, distal, and lingual surfaces, and much of the root was lost. The cement was so placed as to impinge upon the disto lingual angle of the first bicuspid and the mesio lingual angle of the first molar, thus bridging over the interproximate space. This is a fair sample of the painless dentistry which had been done for her. Quite a number of cases of antral disease have been treated for catarrh which, when referred to the dentist have been correctly diagnosed.

DR. GRANT MOLYNEAUX, Cincinnati: I don't see that there is any lack of harmony between the dental and the medical profession. I don't see why we should be eternally running to doctors to tell us what

is the matter when we can tell it ourselves. The paper had reference to a condition following the use of rubber dentures. If a dentist knows that the trouble is from the use of a rubber denture, why go to a doctor to consult about it. When he knows how to relieve it he doesn't need to go to the doctor. Suppose he does go to the physician for the sake of harmony, what can the doctor know about it? He can only diagnose it. He would say, there is a plate in the mouth, you had better see if it is not the plate that produces this condition. In the end he would go to dentist to see if it was not the plate in the first instance, and if he found there was a local lesion, the dentist would refer the case to a doctor to take care of the lesion.

I think the paper was excellent but I don't like to run after doctors.

About three weeks ago a lady met with a street car accident and had her face and lips cut. She called in an excellent surgeon and he didn't know what to do. He did not say he wanted a consultation with a dentist, but he said "you get a dentist." The lips were split and the teeth driven up into the nose and into the side of the mouth. The doctor had faith that the dental profession could take care of it. He didn't even sew up the lip, which was necessary, and the dentist had to stitch the lip and she came to me, an every day dentist—not a double breasted one either—single breasted. A physician was not called in and she progressed rapidly, but if he had attempted to operate there, the very certain result would have been the removal of every one of those teeth and a great destruction, not only in the deformity of the mouth but in the deformity of the face as well. There are many possibilities there. Possibility of necrosis following; possibility of sequestrum resulting from that, or, if there had been a consultation, in case of carelessness of the dentist treating the case. When called to my attention it took a couple of hours to find out the exact state of things. The teeth were pushed up clear out of sight. Most any surgeon would have amputated the whole thing but this surgeon had faith in the D.D.S. profession. He did not say "go to a medical dentist," but he said, "get a dentist to fix that."

DR. W. D. SNYDER, Sidney: In my opinion, if any one feels that he is ignored or not treated right by his town physicians, it is largely his own fault. I have known a case or two of simple abscessed teeth being referred directly from the dentist to a physician. Perhaps to treat an abscessed tooth, he would fill a canal or fill up the tooth and it would afterwards recur and bring a good deal of pain, and he would say, "you had better see your physician about that." Certainly that physician could not have very much faith in the dentist and wouldn't very likely refer any one else back to him who could not see plain enough that the trouble had all come from that tooth.

There have been several little cases that have come under my observation. Cases of spasmodic closure of the jaws coming from erupting wisdom teeth and lesions of the mouth have been referred to me. Patients would go to a doctor before they consulted any dentist and I have known them to be referred to some of my other dentists or friends and colleagues. I think the dentist that will try to educate himself in his line will have no trouble with his physicians, I don't believe the dentist should try to cover the ground of dentistry and everything else. I think it is all right if he knows it, but to try to be both physician and dentist, I don't think it is hardly the right thing to do, but if anybody else gets along well with it it is no business of mine. So far as lesions of the mouth are concerned, he should be as well posted as possible and try to take care of his business as well as he can.

DR. H. A. SMITH, Cincinnati: I was reminded during this discussion of a very remarkable book published lately by a dentist with only the degree of D.D.S. I mean Dr. Bodecker's work, *The Anatomy and Pathology of the Teeth*. I think it is the greatest work of the last decade in dentistry. You know who Dr. Bodecker is? For the last ten years he has given his spare time to the making of this book, and would you say that he was not competent to take care of these cases? This shows that a thoroughly intelligent dentist is capable of producing a work that would be a credit to any department of the whole art. In the book is the celebrated case of Dr. Mahon, a millionaire dentist, the only millionaire dentist I think I know of. Young men, make a note of that. This is called the \$10,000 case. The Doctor does not give the amount of money spent in it for I suppose it would not be professional to mention the fee in a case like that. It is a case where a lady who had facial neuralgia involving the inferior nerve had spent a good deal of money with physicians, and failing to get relief went to Paris and London for further treatment, and these treatments had cost \$10,000. She applied to Dr. Mahon (I don't know whether her common sense or some harmonious doctor sent her), he extracted the third molar and she got well immediately, and the Doctor added to his million by the operation, or ought to, at least, in cases of that kind.

We could go on and tell case after case where doctors had made a mistake, but do you ever think dentists make mistakes? I think they do, I have a good many of them. We must not charge everything to the doctor. The intelligent dentist and especially the ignorant dentist are always making mistakes.

I saw in the clinics the other day, in Cincinnati, a case of an abscessed tooth with an ulcer. This ulcer was the result of an abscess of the lower molar tooth. It was put into the hands of a woman studying

dentistry and in a day or two she had a nice case of healing, and saved the tooth, showing what a woman of average intelligence in dentistry can do. This case had been treated for months by a prominent doctor.

DR. F. E. BATTERSHELL, New Philadelphia: I can say that I was unexpectedly called upon to reply to a toast on a subject somewhat similar to this. I was attending a medical society in our town and what little I had to say was about in this line: that when a physician finds a case of cleft palate it will be, perhaps, just as well for him to turn it right over to a dental surgeon and let him make an obturator for that case. It may save making an operation and lacerating those parts and having a failure on account of it. On the other hand the dentist, after having filled the teeth and treated the pain to the best of his ability, perhaps finds that the patient needs other treatment, then I think it would be courteous to turn the patient over into the hands of the physician, and in that general way of exchange I think this harmony between physicians and dental surgeons should be kept up.

DR. J. TAFT, Cincinnati: It seems to me there ought to be no discord or disharmony between the dentist and the physician any more than there would be disharmony between the oculist and aurist or any other specialist and the general practitioner. They are all engaged in the same line in the general way of practice, making remedies and preventing disease. There is no objection to any of these getting all the knowledge he can that will bear upon his practice. It is commendable to do that that can be made contributory to his success in the treatment of these cases. He ought to get everything that is pertinent to and could be made subservient to the best ends in his practice, no difference whether practicing on the teeth or eye or skin or any part of the human body.

What attainment is necessary to the practice of dentistry? Simply that a man shall have a knowledge of the foundation principles of medicine. The dental schools embrace the foundation principles of medical practice in their curriculum—*anatomy, physiology, pathology*. A state of inflammation in the gum is of the same nature as in the foot or stomach or uterus or anywhere else.

Some of our profession claim that every dentist ought to be a medical graduate; that is, possessed of medical attainments up to about the point of a medical practitioner. When a dentist does that he makes his attainments equal to that of the medical man.

A great deal of stress is laid on the M.D., and D.D.S., and such things. That is simply a certificate that A or B has done such and such work, and it is not worth making half so much of as many people make of it. It is the knowledge that ought to be attained. To know how and to know what to do in cases, that is the great point.

If you are very sick, in great danger, and call upon somebody to help you, do you call upon a man simply because he is a D.D.S. or an M.D.? No, because you know a multitude have this degree you would not trust in a dangerous case. A great many graduates from our medical colleges are no more fit for the general practice, though they have an M.D. degree, than an ordinary dentist; than a great many dentists that have no degree at all.

In this matter of consultation, what is the object of consultation? A has a case, a pretty bad case and wishes he knew more about it than he does. He confesses he don't know about the case and wishes to know what Dr. B says about it, and he asks for a consultation. He says, I want to consult Dr. B and get his opinion about the case, and I want his suggestion about what ought to be done, and he is called into consultation. One man is in the dark and wants some one to help him. Is there anything wrong in that? The patient would not object. I have gone to another dentist frequently to get help in a case in which I felt myself helpless. Many times I have been helped in that way. If it is a case where one feels that a physician would help him, it is right and due to the patient that he go and make such consultation. Wherever you have confidence you can receive aid, ask for it.

An intelligent dentist will never be repulsed by a physician in asking aid in the way of asking for a consultation about a case. On the other hand the physician often goes to the dentist for consultation. Dentists are more and more being called to occupy positions more closely allied to the physician than heretofore. Why? Because they are making advancement all the time—all the time knowing more and more by thorough study—by bringing to their aid everything that can be made contributory to their advancement. This ought to be recognized and will be recognized. Dentists are occupying positions they formerly did not occupy. They frequently occupy positions in medical colleges and lecture in these colleges. Dentists are admitted into medical societies, even the highest medical societies in our country. In the local societies they are largely invited to membership and they are invited to read papers. It shows a closer and closer alliance and harmony and we ought to be delighted to see the day when we will not quibble and talk about M.D.'s, and D.D.S.'s, or anything of the kind.

DR. H. L. AMLER. Cleveland: I have only a word to say and I don't wish to occupy any time in the discussion of this matter. I have heard the remarks of the gentlemen who preceded me and they agree with me exactly. I have no complaint to make of the treatment I have received from the physicians or surgeons. I did not write the paper with the idea that there was a very large amount of disharmony, but

there certainly is some, and it was with the idea of encouraging consultation and a working together of the two branches. One gentleman misunderstood the idea I wished to convey in speaking about rubber dentures. The remark was that where a patient had been wearing a rubber denture, and if a physician was called to treat some ailment that was induced by wearing rubber dentures, it would be his duty to consult a dentist.

CHARACTERISTICS.*

BY F. E. BATTERSHELL, D.D.S., NEW PHILADELPHIA, O.

It is commonly believed that the brute deprived of the soul accompanied power of reason, is endowed with the subtle faculty of instinct, as a recompense. This mental counterpoise of instinct for reason, according to the superficial observer, must needs give to the soulless and subjected animal the entire stock of instinct to render the life balance even. By this, its own sense faculty, it is enabled to grasp instantly and automatically the various circumstances of its environment, for advantage in its existence. The fact that man is blessed with the more excellent gift, seems to overshadow the possibility—the truth—that the nobler creature is furnished with both elements of intellect, either of which may serve, as occasion calls for the better.

Assuming, therefore, that the inferior creature is no monopolist in the singular quality—instinct,—it may be allowed, that, in sharing, the greater degree is retained because of the greater need.

Man's reason towers so above the faculty of instinct that he is oblivious of its influence upon his actions. Oft what he attribute to his own volition, is but the co-ordination of those sets of reflexes, by which certain movements correspond to particular irritants, through vision, smell, hearing, and the like.

These correspondences are wrought by established associations. We see an ambling biped enter our front gate. His visage is unkempt and his wilted garments droop upon his person. We do not stop to question, or enter upon a process of reasoning, but jump at the conclusion that the object focused on our retina is a tramp. Our family dog by his instantaneous process, jumps at the same conclusion with results more effective and much more disastrous to the aforesaid biped.

Habit and instinct are near akin. What one has done many times is done with thoughtless perfection. The garrulous female unmindful of "the base degrees by which she did ascend," becomes a Mother Grundy. How the uncouth plebian becomes the honored patrician, is as much a consequence of habit betrayed, as of successful adventure in politics. "Thou hast been faithful over a few things, I will make thee ruler over many," is more often the *fiatus* of the commonweal, than political bosses admit, or the fortunate themselves suspect.

If the savage animal recognizes in the *genus homo* his foe and master, how much more do the kindred, that are qualified with reason *and* with intuition, discern the variations in *their* kinds? That the occult faculty has more to do in discriminating conditions among men than is ordinarily recognized, we presume is now brought within view. Seeing, then, the consort of reason, the swift interpreter of our ways, is instinct. Therefore let us make our professional call and election sure, by rendering the peculiar homage the dame requires for recognition.

The ecclesiastic is known by his cloth and long face; the family doctor by his pre-occupied air, hurried step, and apothecary odor; the merchant by his alert and accommodating address, mercenary smile, and pencil stuck aslant his ear; the soldier by his commanding carriage and clock-like movements; the lawyer by the midnight air of mystery in his eye, the ultra respectability of his features, and the great depths to which his hands and thoughts seem to descend, betimes, into his trousers pockets; and the dentist by his dyspeptic countenance and the charm of his watch-chain: "Hold!" cries the lawyer, "I object. These outward circumstances are not competent evidence in a court of equity. They oft mislead. There is an indefinable sense within the average mind which enables it to identify the occupation of the person separated from his work and away from the field of labor. Like some strange dream which startles the wakeful senses by the accuracy of the circumstances, past or near approaching; or like a fit of abstraction, when the mental activities are not coordinated with the physical reflexes, and an absurd act is committed by the individual, because the faculties cast out of this "star chamber" council of the mind, have acted independently according to habit, but out of correspondence with the superior court. So the nimble mind, with formulas acquired from habit

is constantly engaged with tests, and is ever submitting reports for the guidance of the understanding."

That this process, transliterated intuition, produces a correct formula for the identification of a dentist, may be discovered by learning what intelligent mind owners count the essential ingredients for the dental compound. The equation should evenly balance, opinion for merit, reputation for achievements. If the formula is imperfect, it is because the ideals, *i. e.* typical dentists, are insufficiently numerous, and a prevailing accurate impression is yet uncreated.

There are counterfeits and imitations, as well of worthy men, as of money and merchandise. A gentle manly bearing, more than a miniature set of false teeth, or a naked three-pronged molar, pendulating from the vest pocket; a cheerful, assuring voice more than an exhibition of much gold in the front teeth and a readiness to explain its presence; quiet culture and trim keeping rather than extravagance, lead to a correct conclusion in an inquiry. A warm soul in a healthy body is a good token, but not a sure sign; for, like "the shadow of a rock in a weary land," it may not always be present. The horny hand of the farmer, the strong hand of the laborer, the mobile hand of the mechanic, the deft and careful hand of the dentist, unlike the untrained hands of men in other professions, soft and blue veined though they be.

A fair countenance will abridge the test. Abstinence from tea and coffee will clear the complexion, steady the nerves, and brighten the eye.

Tobacco, like alcohol, is an incompatible; either one would precipitate any good solution, or give it in as a vulgar associate of "men only." The doe takes the scent of the stealthy hunter, yet out of sight, and is away; so the gentle lady sniffs the vile smell of tobacco, or an intoxicant, and with the hauteur of offense, stops not to consider.

There is that ever nearness or presence of pain, that close observance of its results, that control of the subject and of self, which must beget one of the elements of this formula—sympathy. There is that knowledge of peculiar facts regarding the substitutes and realities of the patient's mouth, eccentricities of disposition, and delicate experiences developed by necessarily close relations of the chair which will supply another quality, the most

needful and patent in the perscription ; it may well be defined the antiseptic, viz: circumspection. Without this ingredient no compound is genuine, it can not be kept pure, will not exhibit the true color, and is liable to effervesce and lose strength after the removal of the stopper.

In some compositions there is found a small proportion—a few minims perhaps—of a bitter tincture—hypersensitiveness—which, though of little consequence in the general effect, renders the particular mixture somewhat disagreeable. The person bearing this aptitude gags at the familiar “doc” or “mister” unmindful that friends often substitute or abbreviate titles to lengthen their affection or respect for those whom they wish to honor most. Is it a *haute nouveaute* of form? This title of Doctor? If it be uttered in a calling voice, on the thoroughfare of any considerable town, a goodly dozen of heads may turn to reply—M.D.’s, D.D.D.’s, Ph. D.’s. V.S.’s, LL.D.’s and possibly some Doctors of Dental Surgery. The title letters of the renowned Agassiz were L. J. R., these preceded his cognomen; the word “teacher” followed to define his vocation. Thus his name, in full, ran Lewis John Randolph Agassiz, teacher. Even this, his own modest choice of name, is abridged by a worshipful and affectionate world. “Agassiz,” alone, stands out in bold relief over all titles and acquirements of honor. “What’s in a name? that which we call a rose, by any other name would smell as sweet.”

Let us therefore fill the bottle. Pour in patience, carefulness, cheerfulness, temperance, skill, invention, conscience, culture, prudence. Fill it until it overflows—it will stretch and widen—keep filling; the overflow is what the world gets, the outflow is our garment of beauty or our covering of rags, according to the contents. What is within is ever circulating outward. A shallow vessel is soon exhausted by evaporation. From a deep vessel the overflow is more abundant, is cool, is quiet, and is exhausted last. Do not pump in from beneath; pour in from above—from books, experience, words of the elders. The good men and superiors in the profession, and from the higher inspiration which descends upon every one who is not slothful in business.

AMERICAN DENTAL ASSOCIATION.

Reported for OHIO DENTAL JOURNAL by Mrs. J. M. Walker.

Continued from page 572, December, 1894.

THE report of Section VI included a review of the present journalistic literature of Pyorrhea Alveolaris, notably the writings of Drs. C. N. Peirce, G. V. Black and J. E. Cravens.

PROF. PEIRCE being requested to open the discussion said that Dr. Rhein's paper had opened up the subject in a practical manner, and was worthy of notice as an intelligent and interesting effort to differentiate the multiform phases of the group of disorders known as pyorrhea alveolaris, some of which are amenable to local treatment, while others are not even modified by it. The first step in the treatment is to differentiate the conditions. What has been called "true pyorrhea," which causes the loss of the teeth, is of constitutional origin, deposits beginning at or near the apical end of the root, the "pockets" are secondary effects. Dr. Black has failed to recognize these conditions or has not met with them in his experience. He states that ordinary gouty conditions are not attended by the suppurative conditions. It is true this is not usually the case, but numerous instances are on record where suppuration has followed gouty deposits in the joints. The tissues around the root of the tooth are very susceptible to irritation and have inflammatory conditions and suppuration follow these "serumal" deposits, beginning at or near the apex of the root.

DR. ABBOTT: I am a good deal like Dr. Black in that I have not seen the conditions described by Dr. Peirce with the deposits beginning at the end of the root and followed by suppuration. I cannot conceive how this can exist without the formation of an abscess and terrific pain and distress before the outpour, the tissues are so dense and unyielding. I believe this disease is due to both to local causes and constitutional disturbances localized in the mouth. I think there is always some local disturbances at the margins of the gum, very slight perhaps—the inspection of particles of food afford a menstruum for the infiltration of lime salts. If the physiological functions of the system were all perfect there would be no such disease, but science says there is no

such thing as absolutely perfect physiological action. There is no such thing as an absolutely perfect eye or ear. None of our organs are absolutely perfect in function. Hence the tendency to abnormal deposits of limesalts in the mouth and elsewhere in an effort to get them out of the body in that way.

In all this talk about nomenclature and terminology, there is too much "fuss and feathers." What we need is an understanding of principles rather than an accumulation and multiplication of names for the same conditions. Words should be used to express ideas. The simple term pyorrhea alveolaris expresses clearly the conditions we find.

DR. CRAWFORD: I will state it differently. The condition known as pyorrhea alveolaris will never occur in any case without the precedent condition of an issue. Whether of local or constitutional origin, after the removal of *all the teeth* you will never see pyorrhea alveolaris. Deposits on the root are the sequelæ of a sinus. The characteristic pockets and all the variable conditions will invariably be found to have had the precedent condition of an issue, though very mild perhaps. Practically we make more mistakes in physical diagnosis than in anything else. I would not enlarge on vocabulary at the expense of the truth, but I am pleased with Dr. Rhein's division of simple and complicated pyorrhea, though I doubt if the use of the terms *simplex*, *complex*, *sequelæ*, etc., make it any more easily understood than plain language which we are all competent to understand.

DR. ABBOTT: I wish to ask Dr. Crawford what he understands by a "precedent issue?"

DR. CRAWFORD: A wound, an opening through which infection enters, whether it is a pin-point puncture or an erosion as big as your hand. An "issue" is an opening. Mercury manifests itself in pytalism only when local precedent conditions were favorable. With corresponding precedent pathological conditions elsewhere, it manifests itself in other portions of the body.

DR. RHEIN: I have been studying this disease for twelve years and my observations lead me to believe firmly in the correctness of the views expressed in my paper. It is true that others, with equally good powers of observation, have reached opposite views; but we are not all equally careful in our observations, we are not all under the same conditions, do not all meet with the same features. The conditions exist in every and varia-

ble degrees. We cannot doubt that the conditions as seen and described by Dr. Peirce do exist, and that he has found these apical deposits without any perceptible break at the gingival border. Because another man has not seen it is no proof that it does not exist.

To my mind nothing can account for the varying phases and clinical features presented, except the varying causes found in varying constitutional conditions pervading the system at large. The question as to why these disturbances manifest themselves about the teeth was most nearly answered by the late Dr. Atkinson, when he said there was no tissue in the body so nearly resembling original protoplasm as the mucus membrane about the teeth. The tissues of the socket of a tooth are different from all joint sockets, being the softest and most vulnerable. That is why it is so extremely susceptible to lack of nourishment with consequent retrogression to primeval order.

DR. JOHN S. MARSHALL referred to a paper which he had read some years ago before the Medical Association, at Washington, on the gouty and rheumatic diathesis in its relation to the periodontal membrane, and spoke of uric acid deposits formed at the apex of the root, when the most careful examination with the finest steel probe failed to show any break at the gum margin or any opening until one was made with the bistoury. A sufficient number of cases of this kind have been found to establish the fact that it does occur. This deposit is a urate of soda. Because this uric acid, reactive from serumal calculus is not found in salivary calculus, is no proof of its non-existence. It is found in some cases where there is no history of gout, and where the serum fails to affect the uric acid tests. This disease of the periodontal membrane is sometimes the very first premonitory symptom of the rheumatic diathesis.

The treatment as for gouty diathesis—cutting off all meat and wine—putting on lithia or distilled water (and I have found distilled water better than lithia in some cases). As long as that line is followed there are no exacerbations of the disease, but drop it and it comes back again. One good dinner with game, champagne, etc., will undo the work of weeks in treating the disease. So long as the patient denies himself he is comparatively free from trouble. So I maintain that these uniform results are proof that the disease is a manifestation of the uric acid diathesis.

There is also a condition of pyorrhea alveolaris resulting from displacement of the uterus and pregnancy. A number of cases have been reported of beneficial results in the mouth from replacement of the uterus. There are many cases the result of a neurathenic condition and it will do to assert dogmatically that it is always due to local conditions.

DR. CROUSE: That there are cases in which the deposits on the root before there is any external break in the tissues is beyond a doubt. The correctness of such a diagnosis has been proved by the extraction of the offending tooth. On the Sunday before Dr. M. S. Dean's death I dined with him. The day before "a great big fellow" had compelled me to extract a tooth which presented no signs of anything as the source of trouble, but he had the tooth-ache and the tooth was sore and out it must come. It was an upper molar, and on one of the roots I found a tiny spot black as jet, near where the pulp passed in. I showed it to Dr. Dean and asked how that calculus could have gotten there. The tooth was not all loose and gave no evidence externally of being in any way affected.

Two or three years later, the man came back with the other sixth-year molar affected in the same way. In some cases where I have suspected this to be the cause of trouble it has got better. Either the deposit has been tolerated by nature or it has perhaps been absorbed and carried off. It is the most distressing disease in dental pathology and it prevents me from crowning many teeth. We can get rid of every other trouble, but this is incurable.

DR. NOBLE said that two years of careful observation had led him to a change of opinion and as he now believes that although it is rare, yet cases do occur with patients of gouty diathesis, of little deposits of serumal calculus near the end of the root with no opening at the margin of the gum. But probably the majority of cases of pyorrhea alveolaris result from pockets—an "issue" to use Dr. Crawford's term. Very careful observation, however, will lead to the conclusion that Prof. Peirce's position is correct.

DR. W. H. MORGAN: It may be so, but I have never met with a case that I did not find an opening, either along the alveolus or through the root canal. I have examined very carefully because these cases give so much trouble. I must repudiate the idea given forth by one speaker that calculus is ever broken

down and absorbed. If in the liver, or bladder, or soft tissues, it may wander around, but it is never absorbed. Nature has three modes of getting rid of foreign bodies, and one of them is by absorption, but we have no evidence that calculi in any part of the body have ever been absorbed.

DR. CROUSE: In one case four upper molars were successively attacked with the same symptoms, I removed the first one to relieve acute suffering, and found a small amount of black deposit on the root. I took out the others as they presented without waiting for protracted acute suffering, though the teeth were perfectly firm, and I found this same black deposit on each one; four upper molars in the same mouth.

DR. FRANK ABBOTT: I think this was a case simply of hypnortosis, mistaken for deposits of the other character; an enlargement of the cementum, causing periosteal inflammation.

DR. C. N. PEIRCE: The evidence is very complete that there is this connection between pyorrhea alveolaris and the gouty diathesis. Every clinician who writes on gout, states that, as an accompaniment "the teeth loosen and fall out." Medical practitioners often unwittingly effect a cure of this disease by their anti-gout treatment of malarial conditions. The patient, with his other symptoms, suffers from intense pain at the roots of the teeth, with inflammation of the surrounding tissues. Abstaining from meat and other anti-gout treatment causes this. One case only, a gentleman came to me last January to have his teeth out; was suffering so that he could not stand it any longer; had to walk the floor all night, etc. On examination I found the ravages of pyorrhea, pockets, and so on. I asked him what he had been doing for it? He replied that he was under a physician's care for kidney trouble. I said that if he placed himself in my care I should put him on the dietary and remedial treatment for gout. He assented and was literally cured by this constitutional treatment. I gave the necessary local treatment at the same time, but he had had that for five years elsewhere without benefit. The antigout constitutional treatment, in connection with local treatment, is successful in so many cases that it is only fair to assume the connection between gout and pyorrhea alveolaris.

DR. RHEIN: The case described by Dr. Crouse represents a number of cases that have been under my observation. Dr. Abbott questions the correctness of Dr. Crouse's diagnosis, but

men often assume that other men are not capable of diagnosing obscure cases. For many years the practice has been advocated of removing the pulp in such cases, but in regard to the ultimate result it cannot always be depended upon.

DR. TAFT: In view of the great importance attaching to this subject, I would suggest the appointment of a committee or commission for the special investigation of this subject, to make a report at the next meeting of this association. If this is done and special work devoted to it, we will get at something more definite than is now known.

One factor has been overlooked in the present discussion, and that is the non-use of the teeth. In many cases defective nutrition is a factor. When one or more teeth are lost the opposing teeth elongate. How is that caused? The teeth do not grow, There is a thickening process going on in the socket, which fills up and the tooth is gradually thrown out. A thickening of the pericementum, showing that a change is going on this membrane that is about out of use from lack of normal function. It is not at all analogous to alveolar abscess; the latter is rapid with acute inflammation, with loss of structure of all the tissues, both hard and soft. In pyorrhea alveolaris that is not true; this affection seems confined to the pericemental structure. An ordinary small instrument shows no less of substance; there is no large cavity about the end of the root in the pericemental membrane involved. What has non-use to do with this? Evidently a change takes place in the pericemental structure when the teeth are out of use. Proper use is necessary for the proper function of this tissue. Take any joint and maintain it in a condition of quiescence, quite free from movement, and it will not be long before there is a changed condition, a filling in or precipitation of calcareous or other matters precipitated from the fluids of the body. In the main pyorrhea is a local affection, but systemic influences modify its progress. Some teeth will rest for years without elongating, but others elongate very rapidly, and it is always those that are not used; those that are the most used are the most healthy. There are other points that would make this discussion too long. I move that a committee be appointed to make special investigations along this line.

DR. JOHN S. MARSHALL: It is not always easy to decide if an affected tooth has a live or a dead pulp, but there is one posi-

tive method and that is the Faradic current. Applied to a tooth, if the pulp is living, you get an instant response. Give the patient one pole and hold the other yourself. Place your finger on a known dead tooth and there is no response; place it on a live tooth and the patient jumps; then place it on the suspected tooth, and the Faradic current will tell you positively whether the pulp is alive or dead.

DR. BOGUE: I am heartily in favor of the committee proposed by Dr. Taft. There are three causes for roughening of the end of the root, *first* is from deposits at the apex, *second* from absorption, and *third* from causes beginning at the gingival margin. A case of the second class lately came under my observation. After treating in vain for six months I extracted the tooth and found considerable absorption, but no deposits and no discoloration. In three or four places there were points as sharp as needles.

DR. W. H. MORGAN: How would you differentiate whether it was a case of absorption or of malformation. Was the end of the root covered with periosteum?

DR. BOGUE: The patient had been in my hands many years, and had lost many teeth from salivary calculus in spite of all my efforts. This left lateral was loose and useless compared with the other teeth, and I saw what I believed to be clearly *absorption*, as described.

DR. HARLAN: With reference to deposits on the roots of living teeth, where there is absolutely no opening at the gingival margin of the alveolus, there is no evidence that those deposits originated while the patient was suffering from gout or rheumatism; there is nothing to show that there had not been some antecedent injury sufficient to produce deposits on the root through the agency of micro-organisms. As far as I know no analysis has been made of deposits on roots of teeth when the continuity of the gingival margins was not destroyed. How many cases of such deposits have been found? Has the difference been established between deposits on the roots where there is and where there is not a break in the continuity of the gingival margins? Deposits do occur and have been found, but I seriously question if it has been demonstrated that the deposits result from the gouty or rheumatic diathesis. Without the formation of a nidus of some character, under the periosteum or on

the cementum itself, accessible to bacteria, such deposits cannot take place. It is impossible to produce suppuration without the presence of micro-organisms. As far as I know the micro-organisms of gout and rheumatism have not been discovered in connection with the deposits of this disease.

DR. TAFT: The deposits in question do not depend upon the conditions described by the last speaker. These salts are held in solution in plasma, perhaps in serum, and are deposited in the root from some change taking place, causing precipitation. The solvent is no longer able to hold them in solution and precipitation takes place. I hope we shall get men who will work in dead earnest on this commission, push the work hard and tell us more than has yet been elucidated.

DR. RHEIN: I feel convinced that the prime necessary condition of all the complex varieties of pyorrhea is mal-nutrition—atrophy. Dr. Harlan says the claims made have not been clearly demonstrated, but it would take too much time here to detail the cases which have furnished the evidence. It is not implied that gouty conditions are necessary to bring about every case of deposits. They are just as possible in neurasthenics, Bright's disease, diabetes, or from local nutrition. There are other forces as well as gout. Toning-up the system always has beneficial results.

Subject passed.

At a later session, in accordance with the resolution offered by Dr. Taft, a committee of five, consisting of Drs. C. N. Peirce, John S. Marshall, E. C. Kirk, M. S. Rhein and J. Taft, was appointed as a commission whose work shall be to make special investigation in the endeavor to ascertain the etiology, pathology and treatment of pyorrhea alveolaris, being authorized to draw on the treasurer for a sum not to exceed \$75.00, to cover the necessary expense of their work.

SECTION VI.—PHYSIOLOGY AND ETIOLOGY.

DR. S. B. PALMER (Syracuse, N. Y.) read a paper on the

ETIOLOGY OF DENTAL CARIES.

Dr. Palmer referred to papers read by him twenty years ago upon the chemical and galvanic action between tooth substance and the materials used for their preservation. His teachings on

this subject were in advance of the times and met with much opposition, but during the twenty years that have passed since those views were advanced, science has overcome prejudice and the principles then advanced are quite generally admitted. Dr. Palmer proceeded to give a summary of the conclusions reached, taking the filling materials in the elements of a battery, defining principles and citing cases. In regard to the potential relations of matter electrolysis must be understood as the principle governing the composition and decomposition of matter. Following this to its terminus in the oral cavity dental caries is an effect of the electro-potential relations of matter. Dr. Palmer then defined the terms used in electrical science, describing the phenomenon known as electrolysis with its application to dental science, a tooth being considered as an electrolyte. The electro-chemical theory is founded on natural laws. There is a continuity of law through the inorganic, the vegetable, and the animal. Organized tissues are subject to decomposition and decomposition resulting from electro-chemical action.

When gold is malleted against the frail walls of a tooth the bruised surface of porous dentine becomes an electrolyte, the metal used being at a potential above that of the dentine, decay results as an effect of electrolysis.

This is entirely apart from primary and independent of the caries arising from ferments, organisms, and organic acids.

Very important discoveries have been made in regard to chemical action in the mouth and the use of antiseptics to prevent fermentation and destroying organisms. But this does not offer a remedy for the arrest of decay from the action of oxides.

Dr. Palmer then described the peculiar complications found in the oral cavity, with its undercurrent of oxygen—a negative element—the tooth an electrolyte raised to the animal or vegetable plane, ready to be acted upon and soon destroyed.

If the bruised portion of an apple is cut out with a sharp blade and the surface dried the wound heals. It is the same with a tooth; cut out the disorganized portion, insert a filling of such material as shall exclude moisture and oxygen and there will be no secondary decay. If the dentine is below normal supply the deficiency by an agent not affected by oxygen, as the ranchman burns a space around his stakes and satisfies the demands of oxygen so that fire stops at the line prescribed. If softened den-

tine and cavities in deciduous teeth are treated with nitrate of silver, the oxide of silver raises the potential of the dentine above that of the secretions of the mouth and caries is arrested or prevented. Nineteen years ago Dr. Palmer wrote "on this principle nitrate of silver turns the teeth dark and checks caries." Oxygen, under the laws which govern the positive and negative relations of the elements, is the primary agent which produces dental caries, and to arrest decay we utilize the oxides—which are proof against oxygen—through the means of metal fillings, which are of higher potential than the organic constituents of dentine. Tin fillings furnish an insoluble stannic oxide through the simple process of oxidation. No decay occurs as long as the black carbonate remains, but it is soft and does not resist the brush or pick. If gold and tin are joined in a filling, by electrolytic action there is an interchange of atoms and an alloy of tin and gold is formed, raising, by induction, a portion of the tin to the same potential as gold, but if not more than two layers of tin are used the dentine is furnished with a carbonate and gold can be successfully used where otherwise it would be a failure. Decay around gold fillings is in obedience to laws which manipulative ability cannot counteract. The current from the filling of higher potential decomposes moisture in the dentine, liberating oxygen, which is attended with an acid, dissolution of lime salts being the result.

In all alloyed amalgams there are unamalgamated particles in the mass which are negative, the amalgamated portion being positive; consequently local galvanic action is established, oxidation filling normal dentine with oxides and sulphide, and no harm is done; but if the dentine is below normal local action is too vigorous, the lime element of the dentine is dissolved, the cavity enlarged and the plug reduced. Line the cavity in such teeth with tin, pressing it in with a ball burnisher and you get the benefits of oxidation filling the tubuli with an insoluble compound, while no local action takes place to cause shrinkage of the plug. The stannic oxide is not objectionable in color and prevents shrinkage from galvanic action, which occurs without the tin lining. Suggestions for root filling are based on the same principles. All fillings below the gingival border are in an alkaline field. Here oxygen gives an alkaline reaction, which is the reason why unfilled root canals do not enlarge in the same proportion as cavities in tooth crowns. Here acid treatment is indi-

cated and is beneficial in destroying micro-organisms. In filling root canals the opening at the apex is a spring which cannot be dried up. Capillary attraction keeps the fine canals filled until the leak is stopped. If an oily substance is used some oil remains which cannot be volatilized even with broaches heated with electricity. In time the oil is oxidized and the canal becomes filled with septic matter. But introduce the liquid of oxychloride, which checks bleeding, and fill with a thin mix; force in a gutta-percha point, which forces all excess of fluid out through the apex and the opening is closed. The permanence of gutta-percha consists in the oxide which remains after the gum is oxydized; this preponderance of oxide prevents further oxydation. The liquid phosphate is not metallic, hence the benefits of the oxychloride over the oxyphosphate. Dr. Palmer described minutely the laboratory experiments which confirm the positions taken and principles established. In conclusion, he said: Dental caries is an effect of universal principle, based upon the potential relations of matter, oxygen being the principal element aided by electrolysis and capillary attraction under the direction of electrical energy.

In the discussion of this paper, Dr. FRANK ABBOTT said that it was always interesting and instructive to listen to a paper from Dr. S. B. Palmer; that he always brought forward absolutely original ideas and that there was very much in them that it should be canvassed carefully by the association. He had nothing to add to what had been said as to the electric theory of caries. He had placed himself on record on that question years ago. As to thoroughly drying root canals, he had long ago given that up as a bad job and does not attempt to dry them in any way, shape or manner. As to the use of essential oils in the canals, Dr. Palmer knew what he was talking about in what he said about that. Wash them out with an aqueous solution of bichloride of mercury, 1 in 10,000, and fill. We formerly treated and over-treated and treated to death, but we have learned that filling the canal is the therapeutic means of cutting off the supply of irritating material. When all irritating material is cut off by a proper filling the wound will heal, even with a cyst at the end of the root. Shut off the source of supplies and it will disappear, with the application of a counter irritant to the gum. Spending time and trouble in trying to dry out a root canal is of no earthly

good, and it is folly to spend hours and hours in the vain attempt.

DR. J. Y. CRAWFORD: All have seen the condition when there is a lump at the end of the root, which may be either a pus sac or a mediated semi fibrous cyst. If it is a pus sac, what becomes of the pus after the canal is filled?

DR. ABBOTT: There is no way of ascertaining the contents of the sac, except with the exploring needle; but absorption does take place, without puncture or destroying it in any way it simply disappears. If pus, it may perhaps degenerate and be absorbed.

DR. JNO. S. MARSHALL: Many of the gentlemen here have been born into the profession since Dr. Palmer's first papers on this subject were read, but at that time it was my good fortune to be a near neighbor of Dr. Palmer's, and it was with great pleasure that I saw going on the experiments which gave rise to the opinions expressed in the paper. In those days men said harsh things about the new departure, but it has created great changes in modes of practice, and how many now put a pellet of tin at the cervical border of a gold filling and save teeth decayed at the cervical margin by filling with amalgam. And the honor is due to Dr. S. B. Palmer. All chemical elements are either positive or negative; all matter the same. Even in our foods one is positive and the other negative, and it is for this reason that certain are eaten with stronger zest if taken in pairs: the familiar ham and eggs for instance, or roast turkey and cranberry sauce. The saliva connects the two poles. This has been tested and proven to the actual deflection of the needle of the galvanometer. These things have a practical value. We all fill the roots of teeth, but we do it blindly, and not on scientific principles. Try his experiments and I feel confident you will get the same results that he does.

DR. A. W. HARLAN wished to ask Dr. Palmer how the essential oils are oxidized in the root of a tooth, and how gutta-percha is oxidized in the root of a tooth? If gutta-percha is an oxidizable substance, why was it chosen to cover the great Atlantic cable? Methods of filling roots of teeth do not properly come under this section. The use of tin at the cervical margins of gold fillings was not introduced by the new departure men. It was in use for thirty years before the new departure was born. The experiments of Miller, Black and others prove that this

electro-chemical theory of the production of caries has no ground to rest upon. Decay is the result of the agency of micro-organisms through their excretory products. The electro-chemical theory of decay is not known, but the experiments of Miller will stand until something more definite shall have been demonstrated before scientific bodies.

DR. MARSHALL: The theory set forth by Dr. Palmer does not in any way antagonize the experiments and conclusions of Dr. Miller. His theory only relates to what is called secondary decay, the result of introducing metal fillings into teeth of low grade, of soft texture, when from any excess of moisture a battery is established in the tooth. He claims that secondary decay is not accounted for in any other way; that it is not always due to faulty manipulation; there is something else that causes that breaking down of tooth structure at the cervical margins of the finest gold fillings. The operation may be as perfect as possible, the gold carefully packed and the filling finely finished, and yet secondary decay occurs—that is his point, why these failures occur. Dr. Palmer does not claim to have been the first to use tin, as described, but I do say that he is the first to give a scientific explanation of its protective value, and he is entitled to that credit.

DR. A. W. HARLAN: That there may be no misconception of my position, I claim that the agency that produces decay in the first place produces it in the second, and that the electro-chemical agency has nothing whatever to do with it. If primary decay is due to micro-organisms, so also is secondary decay. Gold properly inserted in a tooth does not oxidize; it is not soluble.

DR. J. Y. CRAWFORD: I ask Dr. Harlan, a therapist, which pole attracts acids and which pole attracts alkalies? And I ask him to answer definitely.

DR. HARLAN: I do not know what you seek to obtain.

DR. CRAWFORD: I have heard an interesting exposition on electricity and it was stated that one pole attracts acids and the other alkalies. Having the negative pole on one side and the positive on the other, medicinal agents are passed through using a battery. Placed on any part of the organism, one pole will accumulate acids and the other alkalies. If that is a scientific truth, there is more in the theory of electric influences as a factor in producing caries than we imagine. Dental caries, *per se*, both

primary and secondary, is fundamentally the same. There may be many factors in the production of caries, but the specific result is the same. They do not act alike, however, under all circumstances and in all environments. If electrical influence is acid at one pole and alkaline at the other, it may be that it has an important anchorage to that effect in dental caries. I believe in making our record as we go along, and I place myself on record here as saying that I believe that the uses of the amalgams and mercury have been more hurtful to the human family than beneficial.

DR. LOUIS JACK: A few words in explanation of my own inability to accept Dr. Palmer's electro-chemical theory in causing decay of the teeth. It seems to me if that were true that all margins of fillings would have a tendency to decay alike. Because the majority of defects or secondary decay occur at the cervical margin, the theory or hypothesis appears to be proven to the minds of a large number of the profession. But Drs. Miller and Black account satisfactorily for the recurrence of decay from the conditions which exist. If we accept the views of Miller and Black, we do not need the electro-chemical theory.

DR. ABBOTT: One point has not been made clear. If a filling in a tooth is equally perfect in all parts and well finished in every respect, how is it possible for any action to occur between the dentine and the filling, whether electrical or of organisms? The truth is it is all due to imperfect manipulation. There must be something to dissolve the lime salts to start caries. Whether the acid producing this result is due to electricity or to organisms, or to some acid substance in the mouth, the final result is the same, so it makes but little practical difference. Dr. Palmer's idea is a good one. It is very feasible that an electric current is passing from a defective filling to the tooth and return, and that acids are generated. I am not willing to decry the theory, for I think there is a great deal in it.

DR. BOGUE: Can Dr. Abbott tell us how long that battery will act?

DR. ABBOTT: It will never cease as long as the proper conditions exist.

DR. PALMER closed the discussion with a further elucidation of the principles involved, and the subject was passed.

(To be continued.)

SOUTHERN DENTAL ASSOCIATION.

Reported for the OHIO DENTAL JOURNAL by Mrs. J. M. Walker.

Continued from page 581, December, 1894.

DR. W. G. BROWNE, Atlanta, Ga., read a brief paper entitled :

VARNISHING CAVITIES.

Because of the admitted incompatibility of the metals and tooth structure, gutta-percha, chloro-percha, the cements and varnish have all been tried in the effort to overcome the difficulty. As a non-conductor against thermal changes and as an insulator against electrical changes, Dr. Browne finds that a clear resin, such as damar varnish, dissolved in chloroform, offers many advantages, as it is not soluble in the fluids of the mouth, does not discolor, and prevents the discoloration from the oxidation of amalgams showing through their enamel walls. It also acts as a support to frail walls by inserting the filling while the varnish is in a plastic state. For a large gold filling he utilizes the varnish to hold in place adherent to the dentine a mat of crystal gold, or the first cylinder, in commencing the filling. He wished it distinctly understood, however, that he did not depend upon the varnish to retain the filling itself but simply to facilitate the start, though with its assistance deep retaining pits are made unnecessary, slight under cuts being all that is required, thus saving valuable time. No harm can possibly result from its use, while its advantages are clearly apparent.

DR. W. H. MORRISON, St. Louis, Mo., read a brief paper on

THE CARE OF INFANT'S TEETH.

He said that, as a rule, the dentist is not consulted early enough, parents waiting until the teeth are eroded and decayed beyond repair. When they are placed in our charge from infancy, we should adopt the line of treatment suggested by nature, when the child stuffs its fist into its mouth, biting on anything within reach. This is very suggestive and if the mother or nurse will systematically rub the alveolar ridge and palate with the thumb and fingers, expanding the arch in the natural direction, this will greatly aid their growth and development. The lancet

should also be used over the points of greatest tension. This alone will often bring the child out of spasms and save its life. Do not give drugs and "soothing syrups," but rely on physical development. If a change has to be made from mother's milk, then give the milk from a healthy field-fed cow. Condensed milk teeth are not up to the standard. Rely on outdoor air and sunlight, physical culture and development of all parts of the body harmoniously, and in troubled dentition adopt this system of massage in the mouth. This is also to be recommended for older children in cutting the second teeth. By pressure of the thumb and fingers or the knuckles on too prominent points inside or outside of the arch will aid greatly in preventing irregularities, as the parts are cartilaginous and yield readily to such pressure.

These papers were passed without discussion.

HYGIENE.

The report of DR. W. E. WALKER, chairman of this section, was read by the Secretary. The report reviewed briefly the literature of the journals on this subject during the past two years. He said: Accepting as the definition of Hygiene "that branch of medicine of which the object is the preservation of health," and including in Dental Hygiene all that pertains to the preservation of the teeth, the health of the mouth and its tissues, the health of the dentist and the hygiene of his surroundings, this subject covers a broad field, with many subdivisions. The papers which have appeared in the dental journals during the past two years may be classified as Dental Hygiene *per se*: the education of patients and the public in dental hygiene; the hygienic care of children's teeth, accepting another definition of hygiene, *viz*: "the philosophy of prevention, in contradistinction to resistance and cure"; the special hygiene of the dentist and his surroundings; tobacco from a hygienic point of view, *pro* and *con*; hygienic precautions in the sterilization of instruments, the hands, etc.; hypnosis in its hygienic aspects; hygiene in the prevention or the arrest of decay; and last, but not least, hygienic precautions in handling bank-notes, quoting from the address of Dr. Ghion read before the Pan-American Medical Congress in 1893, the alarming statement that "19,000 microbes of diphtheria, scarlet fever and tuberculosis have been found in a single bank-note!"

DR. R. R. FREEMAN read a paper from Dr. T. C. West, Natchez, on

ORAL HYGIENE,

especially in its connection with digestion. The mouths of many patients are rendered anything but pleasant to work upon owing to imperfect digestion. If the mouth were kept clean and the teeth kept in proper condition, digestion would be better. The first step of digestion is the conversion of food into a pulp-like mass, which is accomplished by mastication and insalivation, in which the teeth, tongue and the salivary glands each have an important part to perform. Perfect mastication is not possible with imperfect organs for its performance, any more than a surgeon can perform perfect operations with imperfect instruments; the food, in the process of mastication and insalivation, if mixed with the debris from an unclean mouth and diseased teeth, is not in normal condition for reception by the stomach. Uncleanliness is a prime factor in nearly all diseases of the oral cavity. Patients must be taught the proper hygienic means of preventing this condition of things, though we too often fail in setting the proper example. Our first duty to our patients is to teach them how to care for the mouth and teeth. If an artificial denture is worn they should be taught how to care for this. Whatever our work, whether fillings or crowns, plates or bridges, allow no spaces for the retention of particles of food to decompose in the mouth. Our work too often fails because we do not teach our patients how to care for it. Such teachings will be met with an appreciation that will amply repay the time and trouble bestowed upon it.

DR. R. R. FREEMAN, Nashville, Tenn., read a paper entitled

HYGIENE.

As defined by Dr. Freeman, we understand by hygiene "the laws of health applied, whereby a man may come to his full vigor of life and accomplish that measure of usefulness and enjoy that happiness which human existence may afford." A knowledge of this science secures the means of battling against conditions likely to produce discomfort, pain, sickness or death. To appreciate the present relations of life and secure its greatest benefits, man must recognize his dual relations and act on the hypothesis of a spiritual or soul existence as well as a physical life;

otherwise the question "Is life worth living?" might well be asked. Self-preservation is the first law of nature, but revelation has taught us to help the weak, succor the needy and bind up the wounds of the afflicted. The violation of law entails calamitous results, whether against person, church or state. Health, happiness and prosperity are attainable only through the application of nature's laws. The Great Physician taught not only the value of the soul, but that its temple—these bodies of ours—must in no wise be neglected. The salvation of both soul and body is attained only through the good we do to our fellow men. We of the dental profession play no small part in helping to make it easy for our fellow men to realize the blessings of life. Man may yet attain a great mastery through the science of Hygiene. The light of truth and reason is fast dispelling the darkness, and honest, conscientious thinkers need no longer dread the opprobrious epithets of *crank* and *dreamer* because they maintain there is power and efficiency in the application of some of the agencies which have been discovered through the study of psychology, hypnology, etc., which if rightfully applied might soon hasten the reign of our lovely queen Hygeia. Why should the care of our bodies and the maintenance of health be deemed of less value than the æsthetic adornment of the dwellings we inhabit? The times are ripe for a new specialist—the Counsellor of Hygiene!

DR. GEO. J. FRIEDRICHS, New Orleans, read a paper entitled

DENTAL CARIES AND SOME POPULAR FALLACIES.

Among the causes most popularly assigned as factors in producing caries, Dr. Friedrichs pronounced adversely upon such "causes of decay" as sweets, hot drinks, climate, soft foods, lack of cleanliness, insufficient use of the teeth, etc., his conclusion being: Given a perfectly organized denture, an unimpaired nervous system, in a sound body, without inherited taint, and the teeth would never decay so long as this condition was maintained, irrespective of climate, food or external agents; even cleanliness, now considered so essential, would be unnecessary, and be practiced only for comfort.

DR. COWARDIN thinks that the unhygienic diet of children, especially in the injudicious use of "sweets" to the exclusion of proper food, is largely the cause of the poor teeth of so many children.

DR. R. R. FREEMAN, on the other hand, believes that the appetite for "sweets" is a natural appetite in children, and that proper indulgence in this respect makes them happy and consequently healthy. He quoted himself as still a child in that respect, still indulging freely in sweets, yet having a denture above the average for a man of his age. He said: Nothing touches me more than to see children deprived of their legitimate sweets! No matter how miserable or how pouting a child may be, they can't look cross while eating sugar candy. Never deprive children of what they enjoy. It is not the sweets that hurt them but the lack of other food in addition to the sweets. Candy made from pure sugar—not the cheap, chemically adulterated stuff—makes children good natured and happy, and when they are happy they run and jump and exercise and are healthy. It is not the sweets, but it is the high living, improper dressing and enforced propriety of demeanor that is ruinous to the proper development of children and gives them the anæmic look and puny constitution.

DR. J. Y. CRAWFORD considers climate so conspicuous a factor in the production of dental caries that it may be classed among the zymotic diseases. Want of functional activity is also a pronounced factor. The influence of heredity he places at the tail end of the list of factors in the production of caries and irregularities. The present system of education, with the early confinement of young children to the school-room, he considers conspicuously responsible for the early destruction of teeth. As only the dentist is competent to decide when the infant is fitted to leave the breast and masticate solid food, so also should he pronounce when it is prepared to masticate the food that will prepare both body and brain for the work of education. The ordinary American child between the ages of four and nine is not able to masticate the food that will enable it to bear the strain of the present school system. Too much money is spent at the wrong end of the line in this matter.

Before the subject of Hygiene was passed, DR. A. C. HEWITT, Chicago, demonstrated from the platform his method of using chloroform as an obtundent, the patient inhaling a small amount of the vapor of chloroform from the mouth of a small vial, the effect being to deaden pain before reaching the point of anesthesia. Dr. Hewitt claims to have used chloroform in this way,

for the extraction of teeth, etc., for thirty years, and considers it absolutely safe. During that time he has never had an accident or even an alarming symptom. Being asked how he knew when he had reached the right point for the obtundent effect. Dr. Hewitt replied that he watched the countenance and noted a slight contraction of the nostrils as if there were a muscular effort to close them against the vapor; also a lazy droop of the eyelids, and an easy settling down in the chair. Inhaled in the manner described, he considered that the patient got about one part of chloroform vapor to one thousand of atmospheric air.

THE CHAIR: There have been so many cases where the first inhalation of chloroform has proved fatal, that it should not be allowed to go out as the voice of this association that chloroform is ever absolutely safe. Although Dr. Hewitt has never had an accident, he may have been treading on the brink of the most imminent danger.

DR. SILL (New York) thinks the method of Dr. Hewitt possibly much safer than the ordinary mode of administering chloroform, as so large a portion of atmospheric air is inhaled.

Instances were cited by several members of fatal or nearly fatal results from very slight inhalation of chloroform.

DR. JOHN MARSHALL was very emphatic in the declaration that *chloroform* is *dangerous*. He never administers it for the extraction of teeth unless the patient is at home, in bed, considering the recumbent position essential to safety.

DR. HEWITT, on the contrary, believes the recumbent position a great source of danger, as the heavy vapor of chloroform settles down upon the face and clogs the lungs, while in the sitting posture, as in the dental chair, the falling vapor passes the nostrils and mouth, only the small amount being received that is voluntarily and forcibly inhaled.

The question was discussed at great length by Drs. Sill, Noble, T. B. Welch, McKellops, Freeman, Freidrichs, Peirce, John S. Marshall.

DR. JOHN A. DALY read a paper on Hygiene in Prosthetic Dentistry, as reported under that section and Hygiene was passed.

ALL SORTS.

New Style Forceps.—At a meeting of the Odontological Society of Great Britain Mr. Sefton Sewill showed forceps made with a locking hinge, which could be readily separated and cleaned for aseptic purposes. The work of making the forceps had been carried out by the Dental Manufacturing Company.

Dentistry "up to Date."—The following amusing answer to a query as to the use of arsenic for devitalization of the pulp is taken from the *Echo*: "You cannot use arsenical paste to destroy the nerve. I have found it best to let pieces work out carefully, using pieces of wool meanwhile to protect the cavity from cold and consequent neuralgia. Gargles of borax occasionally, and if all does not go well thus, see a homœopathic doctor."—*Journal British Dental Association.*

Bichlorid of Mercury in the Treatment of Pyorrhea Alveolaris.—In an article on "Pyorrhea Alveolaris," appearing in the Dec. issue of the *Journal of the British Dental Association*, Dr. E. W. Roughton says: "I believe the most difficult part of the treatment is to render the pockets aseptic. As far as my experience goes, the most efficient remedy for this purpose is perchloride of mercury dissolved in water, alcohol or peroxide of hydrogen in the proportion of one grain to the ounce. The method of using it is as follows: A thin wisp of absorbent wool is soaked in the perchloride solution and laid across the neck of the tooth; it is then poked down into the pocket with a fine probe. Every pocket, no matter whether on the labial, lingual or proximal aspect of the tooth, must be dealt with in this manner; when the pockets are deep or sinuous in outline the gum over them should be slit up parallel to the long axis of the tooth, so that no out-of-the-way corner may escape the action of the antiseptic. The oftener the application can be made the quicker and more certain will be the result. It is desirable that the remedy should be used twice a day at first, then, gradually diminishing the frequency as the suppuration diminishes. It is essential that the treatment should be persevered in for some time after apparent cure, and even when it has been thought safe to stop treatment the patient should be seen periodically, to make sure that there is no recurrence."

The Neuralgia of the Toothless.—In the *Journal des Praticiens* there is an article on this subject by M. Duplay, in which he remarks that this form of facial neuralgia is supposed to have its origin in the

compression of the dental nervous branches by a condensing alveolar osteitis. The neuralgia of the toothless is seen also in others, for recently M. Duplay observed a case in which the attacks had recurred for seven years, and had not yielded to treatment. Any movement of the mouth produced pain. The majority of the patient's teeth had been extracted, but the neuralgia persisted, and resection of the infra-orbital nerve was done. Nine months after that pain returned, and all the teeth of the right upper jaw were extracted, except the two incisors and the canine. The pressure had given rise to severe pains. This neuralgia, says the author, was analogous to that of the toothless; there were none of the classical Valleix's tender points, but there were pains radiating toward the ear, the neck, and the eye. Pain was produced by pressure on the alveolar border of the right upper jaw, and, finally, there was an alveolo-dental periostitis. With regard to the treatment, says M. Deplay, sulphate of quinine might be prescribed successfully if the neuralgia was idiopathic and intermittent. Symptomatic neuralgia with a nervous lesion indicates other treatment. This is a specific reflex neuralgia, having the dental lesion for its origin. Resection of the facial nerve had been done, but had given only temporary relief. Excision of Gasser's ganglion could be performed, but it was a dangerous operation, and M. Duplay preferred to attempt the resection of the alveolar border near the seat of pain, as advocated by Gross, of Philadelphia, in 1870, and advised it in the neuralgia of the toothless.

Severe Hemorrhage from the Gums.—At the First District Dental Society Dr. F. Milton Smith said: "I had in my practice last week a peculiar case, which I think may be of interest. A gentleman came to me at six o'clock on Saturday afternoon, saying that his brother-in-law was having a very severe hemorrhage from the gums. He was under treatment by his physician. The hemorrhage had commenced about four o'clock Friday afternoon, and it was thought the patient had lost nearly two quarts of blood. He woke in the night with his mouth bleeding very badly, his night-clothing covered with blood, and the bed-clothing saturated. The hemorrhage continued, notwithstanding the application of remedies that were applied externally. No operation had been performed, and there seemed no cause whatever for the hemorrhage. I found that on the right side of his mouth, between and around the bicusps, the blood was oozing out quite rapidly. On the left side, at about the same points, I could find no wound nor apparently any cause. In a very little while his mouth would fill with blood, and he would have to expectorate. Knowing that the physician had applied different remedies without effect, the thought suggested itself to take some impression-material with me, get an impression, and make a gutta-percha plate to

act as a compress. After inserting the impression-material, I thought I would let him bite up solid, and see what the effect would be. I did so, and after leaving it there until it got quite hard, I found the hemorrhage was entirely shut off. The other side was bleeding at the same rate as before. I heated another piece of compound and pressed it into the mouth in the same way. I instructed him to keep his mouth tightly closed, and when he was ready to go to sleep that they should bind his jaw tightly, so that the pressure would be continued. That was six o'clock Saturday evening. On Sunday I called on him at nine o'clock, and found there had been no hemorrhage since. I very carefully removed the plugs and found hardly any clot, and the hemorrhage had entirely stopped. It struck me as a novel idea of treatment, and the case was also peculiar in that there seemed to be no cause for the hemorrhage."—*Dental Cosmos*.

How to Make a Substantial Crown.—In the Dec. issue of the *Dental Review* Dr. H. H. Wilson gives his method of making a crown similar to the Knight combination crown but possessing at least two points of advantage, viz: strength, and ease of construction. His method is as follows:

"First select a Logan crown suitable as to size, shape and color—and herein lies the weak part of this method, as I do not see how such a selection is possible by any dentist who is so situated as not to be able to run into a dental depot and do his own selecting. I often find it difficult, though I have only to go across the street. We will suppose we have a superior central incisor to crown. Cut off the tooth at the gum line and a little below all around. For this purpose I find the Ottolengui reamers admirably adapted. Enlarge the canal sufficiently to receive the pin of the Logan crown, and try in the tooth before grinding it that there may be no mistake in the selection. Remove what little enamel there is left on the root, which is easily done with Dr. Case's scalers. Fit a narrow band of 22k. gold and grind flush with the end of the root, lay this on a flat piece of pure gold, about thirty or thirty-two gauge, and solder by placing a small amount of solder on the outside of the band and holding over a Bunsen burner. For this as well as the previous soldering of the band I use 22k. solder. Trim off the surplus gold around the band, but not too close. Grind away the palatal portion of the crown the same as advocated by Dr. Knight, but do not disturb the pin. Place the cap over the end of the root, and with any sharp pointed instrument make a small hole in the center of the cap. Into this insert the post of the crown and force into position. When the correct position is obtained remove the tooth, leaving the cap, and force the post through a piece of the same pure gold as was used in the cap and large enough to more than cover

the ground surface of the crown. Burnish down around the edge and trim off, leaving an overhanging margin of one line in width. It is not necessary to solder this disk to the pin until the final soldering is done, as it will cling tightly enough to remain in position. Now place some sticky wax around the pin, warm it over a spirit lamp, and place in position. Remove parts held together by the wax, invest and solder with 20k. The wider this V-shaped space is, the easier it is to flow the solder. This may also be aided by packing the apex with foil. When this crown is completed I have secured the same result as Dr. Knight, except I have not left the palatal portion of the tooth. This I do not believe is necessary. I have, on the other hand, by not cutting off the pin, gained strength to the crown, a result very desirable. And withal, I have simplified the operation, having on several occasions completed it and set it at one sitting. For setting I prefer gutta-percha. Being able to deflect the pin either forward, backward or laterally, I see no necessity for cutting it off."

The Use of Kreosotum in Dentistry.—In an article appearing in the January *Dental Cosmos*, Dr. G. H. Winkler says :

"I ask your attention to a consideration of that pathological condition of the mucous glands of the mouth, or more especially those situated on the gingival borders, or free margins of the gums, which results in the excretion of an acid corrosive fluid that excoriates the epithelium and corrodes the teeth. . . .

"The glandular excretion in some patients is clear, limpid, and sharply acid. The teeth appearing clean, but presenting slight erosions at their necks, which are of the same color as the teeth, firm to the pressure of an instrument but exquisitely sensitive ; or the erosions may present the chalky white appearance of rapid acid disintegration, slimy in feeling, with pits penetrating here and there along the line of decalcification, and like the first extremely sensitive. In other cases the excretion is turbid, viscid, excoriating, corrosive, and fetid or putrid, covering the teeth with a murky or yellowish slime, which no amount of cleaning can keep off while the disease exists.

The results of this disease present a number of phases. In the first place, we have slight erosions around the teeth, which are sensitive to the touch or to sweets when taken into the mouth. Patients sometimes complain that they are not able to clean their teeth or use the pick without pain, or the erosions may be more generally distributed over the surfaces of the teeth, and in the case of little children sometimes the pain is so great that they cannot sleep except under the influence of anodynes. .

"Kreosotum, in my four years' use has proved itself to be almost an absolute specific for the disease we are considering, and in consequence

of the great frequency of the demand for it I consider it the most valuable medicine I have at hand in the practice of dentistry. I frequently administer it with very marked benefit for several weeks before excavating decay, for filling, in very sensitive teeth. I administer it in powders, pellets, or in liquid form, from 6 x to 12 x, prescribing that form which may be most conveniently taken by each individual, in such oft-repeated doses as will secure for them the dynamic force of the drug.

In order to emphasize the above facts, I cite the following out of a great many cases that I have treated.

Case I.—Mrs. J. C. C., a prominent southern lady, came to me on June 2, 1890, to have her mouth put in order. I found several cavities in her teeth, which I filled. I also discovered an extremely acid condition of the secretions, a line of corrosion around the necks of nearly all the teeth, and a sensitiveness which was almost excruciating to the touch of the tooth-brush or wooden pick, and extremely painful when sweets were taken into the mouth. I prescribed a detergent and stimulant mouth-wash and advised that precipitated chalk be rubbed thoroughly in between and around the teeth upon retiring at night. I continued the treatment for this condition for a year, using at times lime-water and bicarbonate-of-soda washes, and occasionally inserting one or two fillings; the pain that she suffered being at no time alleviated, but always most persistent and distressing.

On June 9, 1891, a year later, having discovered my present treatment, I prescribed kreosotum in pellets, which were taken for about three weeks. In a few days after beginning the medicine she was relieved of pain, and has been comfortable ever since; and the decay of the teeth has been so arrested that it was not until July 27, 1894, that she came to me again for services, requiring then but two fillings. She was a martyr to the pain and discomfort of this disease during that first year, and during the same period required the treatment and filling of several roots and of ten cavities. . . .

"I am honestly and thoroughly convinced that fifty per cent. of the cavities of decay which are found in most persons' teeth at the age of maturity could have been prevented; in other words, I believe that fifty per cent. of the decays of young people's teeth are absolutely preventable. And I think that no treatment for dyspepsia can be quite so efficient as that which begins in the oral cavity."

Finishing Fillings.—Every dentist knows how to finish fillings but many times they are not properly finished. Improper finishing is often one of the most fruitful causes for recurrent decay. In the January issue of the *Dental Practitioner and Advertiser*, Dr. E. T. Darby gives some excellent hints on this subject. He says:

“Every dentist knows that there has not yet been produced an amalgam which will upon hardening leave a smooth surface. He also knows that the rough surface is detrimental to the stability of his operation, leaving the question of appearance aside. Now it must be granted that the large quantity of amalgam fillings are not introduced with the idea that they are not to receive a fine finish; consequently when hard they are not susceptible to the refining influence of the engine and polishing materials. But when properly introduced, under cover of the rubber dam, and ordinarily quick setting, they may be finished before its removal, and with the expenditure of but very little time.

“First, they should be trimmed into shape with properly formed, sharp instruments, then follow, if proximal, with the finest cuttle-fish strips, and finely polished with flour pumice, using architects’ cloth as a vehicle. Fillings that are accessible to the engine should receive the same treatment, substituting the fine leather polishers for the tapes. Fillings that are given time to harden, and require a second sitting, will necessarily demand more time, and the emery tapes and fine corundum will be needed at first.

“Tin fillings require a good deal of burnishing throughout the process of finishing; otherwise they require the same treatment. It will be found, however, that sand-paper disks or strips cut better than emery on tin.

“It is of course understood that all phosphate and oxychloride fillings are hardened under the rubber dam, and finished before its removal. Sharp scrapers, when the filling is accessible, should be used to remove the surplus, these to be followed with the fine cuttle-fish strips, and the final finish given with architects’ cloth, without the help of any powder whatever. The burnisher, if used at all, should be without force.

“A gutta-percha filling without a smooth surface is an abomination. But to produce it is not always an easy task. The friction with chloroform as advocated by some, has serious objections, for while it leaves an even surface, it does not leave a hard, smooth one. The use of hot instruments for trimming is liable to leave an imperfect filling. Grinding is out of the question, so that nothing remains but the cutting instrument, finely sharpened to accomplish the work. A little experience will enable the operator to produce almost a perfect smooth surface, if he keeps his instruments sharp.

“The labor of finishing proximal fillings is reduced to a minimum by using a properly adjusted matrix for gutta-percha and phosphates. A mere wiping of oil will prevent the latter from adhering.

“Gold fillings seems to be the pets of most operators, and therefore receive the most attention, when really it is no more essential that they

should be smooth than any other. They call for the same *modus operandi* that is suggested for hard amalgam, with the addition of burnishing. Sharp trimmers should be employed for proximal fillings, followed with emery strips or disks, and finishing with cuttle-fish, and finally the architect's cloth with flour pumice for the final polish. Between each step the burnisher should be used. The engine is suggested when accessible, with fine corundum, followed with the leather buffs and pumice to a final finish.

"I suppose the last finish given a gold filling is simply a question of taste. In front teeth I have seen large gold fillings which were as dazzling as high-finished Bowery jewelry, and quite as suggestive of deficiency in refined taste. The modest, soft, velvet-like finish which flour pumice will impart to metals, has no equal, both for durability and appearance. This should be applied after the filling is finished, when one is satisfied that it is good enough. It requires but a minute more of time, and the result justifies the outlay. Apply it with buff leather polishers, running the engine very, very slow, or if with architects' cloth or linen tapes, work them slowly. This flour pumice is easily obtained by stirring ordinarily fine pumice into water, and allowing the bulk to settle, after which pour off the cloudy water into a shallow dish, and place it in the sun to evaporate, and when dry it will leave the flour pumice ready for use. . . .

"You will join me in the assertion that overlapping edges are the rocks upon which many of our finest efforts are wrecked, so that I need not caution you against them. Perseverence and a good supply of sharp trimmers will enable us to avoid the danger. I have no sympathy for the man who fills proximal cavities in posterior teeth without the matrix, and has a protrusion of filling to cut away at the gingival margin.

"Too many fillings are introduced without the final result of finishing in view, consequently much grinding and vexation of spirit is required to remove a surplus which would not have been there if the original shape of the tooth had been given a moment's consideration at the outset.

"A few moments' careful study of the articulation will very materially lessen the work of finishing, and relieve the necessity of coarse corundums, which have no place on properly shaped fillings."

A New Method of Applying Force in the Regulation of Teeth.—In an interesting article on this subject in the January issue of the *Dental Digest*, Dr. E. H. Angle says:

"For a long time I have been experimenting with a novel way of exerting force to a moving tooth and so well pleased am I with the results that I am convinced the plan is destined to occupy a permanent place in Orthodontia.

"The power is derived by the lengthening of wire resulting from pinching or compressing its bulk laterally between suitably formed beaks of strong pliers."

Several cases are given to familiarize the reader with this system. Case No. 1 represents an inlocked incisor to be moved outward and rotated, of which he says:

"A rod of metal of suitable length to extend from the anchor tooth and bear against the moving incisor, is held in position by one end being made to rest in a pit formed in the enamel of a deciduous second molar, which has been selected as the anchor tooth. The other end of the wire is secured in a section of tubing soldered to an accurately fitting band cemented upon the incisor. Force is exerted upon the moving tooth by occasionally pinching the wire with the regulating pliers.

Each pinch of the wire causes it to be lengthened about one one-hundredths of an inch. Two or three pinches each day or alternate day will be found sufficient to rapidly move the tooth into its desired position. In the case here shown the movement of rotation as well as outward being necessary, the force was directed against one side of the tooth, thereby accomplishing both movements at the same time.

"After the tooth had been moved into the desired position, it was retained for a few days by the appliance shown, after which the appliance was removed and the further retention of the tooth effected by the proper proper occlusion of the opposing inferior incisors."

Another case illustrates the moving outward of the two inferior deciduous cuspids. In this case pits were drilled through the enamel on the lingual surfaces of the cuspids into which was made to rest the ends of the wire to be lengthened.

This method can be employed in various forms of irregularity, if good judgment has been used as to proper form of appliance, etc.

In conclusion the author says:

"It is not to be supposed that this method will supercede the use of the jack-screws although in many cases it will be found more desirable as it is so extremely simple and compact. Its greatest place of usefulness will be found in the movement of the teeth of young children, where great force is necessary and the smallest of appliances desirable.

"The wire for lengthening may be made of platinized gold, silver, brass, or what is much better than all a fine quality of German silver, which takes the desirable degree of temper at the point of pinching, so that the wire maintains the same stiffness as if the depressions by pinches had not been made.

"The most desirable size, as well as materials, is found in the author's appliances for regulating the teeth and is known as the anchor and retaining wire G.

"The regulating pliers are beautifully adapted to the work for which they are intended and are so shaped as to reach all parts of the mouth. They should never be used in pinching large or hard wire or they will be injured so that evenness and accuracy, so necessary, will be impossible."

The Etiology of Defective Enamel.—In an essay read at the American Dental Society of Europe, by Dr. W. E. Royce, and printed in the January *Dental Digest*, the writer referring to the effect on the developing enamel, of mercury administered systemically, says:

"Remembering that the enamel organ is formed from the epithelium of the mouth, and that during its creative period it remains in close relation to it, it seems safe to say that whatever affects the mucous membrane, is likely to produce a similar effect upon the enamel organ. If the enamel organ is inflamed it cannot do its work. If the mucous membrane is inflamed it is most natural to suppose that the enamel organ will suffer with it. Mr. Jonathan Hutchinson told us twenty years ago—that stomatitis is the cause of defective enamel. We may go further with him, and say that while it is not always the case, in a very great majority of cases stomatitis is caused by mercury. I believe we may go even further and attribute to hereditary mercurialization what Hutchinson attributes to hereditary syphilis. The fact that these teeth are much more common in England than in America, first attracted my attention to them, and in my own mind I associated them with a free use of mercury long before I knew that Hutchinson had written upon the subject. Having, after years of observation, come to this belief, I undertook to test my theory by experiments. The experiments in regard to the hereditary effect of mercury are not yet completed; at a later day I hope to place the results before you. Those relating to its direct action were I think, sufficiently successful to justify my presenting them.

"I took for the experiment a litter of two weeks old healthy puppies. One was treated with one-half grain doses of calomel, another with one grain doses of Grey Powder (*Hydrargyrum cum Creta*) daily, while a third was not treated. The drug was discontinued whenever the dogs showed the slightest ill effects. This treatment was continued till they were two months old. . . .

"The puppy that had not been treated died. The smaller one was treated with calomel and its effect upon the teeth was very manifest. I now believe that smaller doses would have produced as great, or even greater results. The larger one was treated with Grey powder, and there is no apparent effect of such treatment upon the teeth, except a pit on

each of the superior second molars. Nevertheless I believe that Grey powder is accountable for many of these defects. . . .

"Mercurial stomatitis is produced by its constitutional action, and we have the best of authority for saying that the constitutional effects of mercury are identical however exhibited. . . .

"Idiosyncrasy would render some children peculiarly susceptible to this drug.

"Many apparently hereditary effects can also be accounted for by the use of mercury. Several children of the same family, or mother and child, have defective enamel. Inquiry usually reveals the fact that they have been treated by the same doctor, or attended by the same nurse, and like causes have produced like effects in each case.

"We cannot, however, ignore the fact that there are cases of imperfectly formed enamel, where the cause must have existed before birth. . .

"I have no wish to undervalue the use of mercury, in certain cases. At the same time, it should be administered to adults with a full knowledge of its possible ill-effects, while its administration to children, except in most extreme cases, should receive our most emphatic protest."

The Relative Penetrating Power of Coagulants.—In a paper read at the Academy of Stomatology, Philadelphia, and printed in both the *Dental Cosmos*, and the *International Dental Journal* for January, the author, Dr. James Truman, showed the results of many experiments as to the relative penetrating power of coagulants. After briefly citing the views presented by Drs. Harlan, Black, and Hugenschmidt, which contraindicated the use of coagulating agents where a diffusible medicament was required, he states:

"The position taken by myself in 1889, that coagulants placed in the central canal would permeate the tubuli and coagulate the contents, remains true to-day as the experiments in capillary tubes will demonstrate, and as was previously also demonstrated by Dr. Kirk, reported in the *Dental Cosmos*. It is therefore, useless to combat the ideas entertained in the quotations of an opposing character, as they have no force. The question might be left where it was placed by those experiments, but it seemed to me there was something more to be said on this question not entered into by Dr. Kirk. Some of these points were taken up seven years ago by myself, but dropped for a more favorable opportunity to continue them.

"My intention was to endeavor to show that coagulants would penetrate tubes of the minutest character possible to be handled satisfactorily, and that this penetration was independent of circulation. My earlier investigations seemed to warrant this belief. Diffusion is recognized in

the living tooth as performing an important and continuous part in its nutrition. It seemed certain as the tubulated portion of the dentine invariably imbibed finely-divided colored matter in solution, that therefore it must take up any other fluid, if of equal solubility, with the same facility. This beyond question is true; the main difficulty here being to demonstrate that the coagulation was continuous without the aid of diffusion.

"The early experiments abundantly proved this to be true, but they were carried on, at the time, with difficulty.

The effort was, as before stated, to find results in tubes not exceeding a millimeter in diameter, and if coagulation occurred it must be through absolute contact of the agent with the albumen or gelatin used in the experiment. It was necessary to fill the minute tubes with the albumen and then seal the ends. Both processes were accomplished readily by nearly filling the tubes and then quickly melting the ends in a Bunsen burner. This proved entirely satisfactory. It was found, however, that the albumen in the tubes dried and contracted upon itself, leaving spaces. To meet this difficulty, the albumen was combined with twenty per cent. of glycerin. This served an excellent purpose, and proved no interference with coagulation either in large or small tubes, with all the agents known to be positive coagulants, with one exception. It was found that mercuric chlorid had little or no effect apparently on albumen and glycerin. This was repeated a number of times. It was then applied to albumen without glycerin, and coagulation was immediate. It was found however, that glycerin simply delayed coagulation, for in the course of a few days the effect of the mercuric chlorid was plainly visible in flocculent masses.

"This fact necessitated a repetition of all the experiments to determine their correctness. It was found that mercuric chlorid was the principal one of the series seriously antagonized by the glycerin.

"These experiments have occupied several months, as the conclusions were not arrived at until constant repetitions, under varying conditions, had demonstrated their correctness.

"The tubes were drawn to varying lengths, not exceeding as a rule, 0.5 millimeter in diameter. The unit of time was fixed at ten days. The first series exhibited some variation in the number of centimeters; but, as the measurements of the fluids had not been exact, it was determined to try the most important coagulants a number of times with great accuracy. This gave more satisfactory results showing showing in Plate No. 2 very little variation in duplicate, while in Plate No. 1 there is a difference of fully a centimeter in some of the tubes.

"When the results of these experiments are analyzed, it is found

that no results were attained with chromic acid. Silver nitrate exhibited thorough coagulation. With zinc chlorid the coagulation is complete. Carbolic acid shows partial coagulation in all the small tubes, but complete in No. 5, plate 4. This last tube, however, was not started properly, owing to difference in density of the two liquids causing them to mix to some extent. . . .

“Whenever possible, the effort was made to have coagulation proceed in opposition to gravity.

“What does the work as a whole teach? 1. That coagulants do not prevent by their own action the diffusion throughout the entire tube.

“2. That the penetrating power of such agents as creosote, carbolic acid, and zinc chlorid, those most frequently used, varies materially. That creosote is a very poor coagulant when compared with carbolic acid, and the latter for this purpose, is not to be compared with zinc chlorid or silver nitrate.

“3. That in proportion to the coagulating power of the agent will be its penetrating force, independent of gravitation.

“No attempt was made to determine with exactness the penetrating property of essential oils, but if coloration is any indication, the tubes presented do not indicate that this is of much value in closed tubes; but this, it is acknowledged, may not apply in tubes where circulation is an adjunct to aid penetration.

“It will be observed that creolin gives but slight coagulating effect, oil of cloves about the same, carvacrol shows slight cloudiness, sanitas oil slight coagulation, mercuric chlorid no coagulation in this tube (glycerin and albumen). Tannic acid shows extended coagulation; oil of cinnamon, action marked but limited; oil of cajaput, no result; caustic potash, no result in this or other tubes; zinc chlorid in gelatin, no result; phenol sodique, partial coagulation. Eugenol is but a poor conductor.

“Tube 10, Plate 4, is given to show the possible action of oxychlorid of zinc on the contents of the tubuli in the dentine. The oxychlorid, of the same consistency as used in pulp-canals, was placed in the funnel portion of the small tube. It soon hardened, but the coagulating process was marked upon the albumen. It began immediately, and has continued without interruption to the present time. The line of demarkation between the oxychlorid and the coagulation is distinctly shown. This, probably, is one of the most satisfactory of the tests, as it abundantly proves that contact with albumen is all that is necessary to produce coagulation with zinc chlorid, and if this be possible out of the mouth, how much greater must it be under more favorable conditions in the tooth.

“Caustic potash was experimented upon not as a coagulant, but to observe the effect on albumen and gelatin. Though several tests were

made no visible results were produced, though this does not antagonize the recognized quality of this agent as one of the most deeply penetrating and uncontrollable caustics used on the tissues.

"The action of nitrate of silver in repeated tests was rather a surprise. It has generally been regarded as a superficial coagulant, but in every instance it has proved deeply penetrating and coagulating with rapidity and certainty, very nearly equal to zinc chlorid. This fact assumes more importance in connection with the use of this agent in teeth. Its rapid penetration raises the question, Can we use it without danger to the pulp in posterior teeth as has been recommended? At present I am not prepared to answer this question, but seems as though a risk equal to that assumed in the use of zinc chlorid is taken when placed in children's teeth for the prevention of caries.

"The experiments were extended to the penetration of the tooth-structure by a number of coagulating agents. A large number of teeth were kept under the action of these, the pulp-canals being first slightly enlarged and filled with the agent daily. The result has not been entirely satisfactory; microscopic examination shows decided action throughout the dentinal tubes, in several sections being nearly obliterated and indicated only by fine lines; but while this demonstrates a positive change in the organic contents of the tubes, it does not absolutely show that this has been caused by the coagulant. Thus far I have been unable to carry the stain given the agent along with the coagulation. Silver nitrate in several sections penetrated in seven days two-thirds the length of the tubes, but the extreme discoloration made it impossible to follow the individual tubes except at the extreme limit of coloration. Tests were made with a variety of stains, but with no result, the coagulation invariably separating from the stain. When the color can be carried along with the coagulation, it will visually show what may be regarded as absolutely true, that the coagulant is carried in the dentinal tubes as effectually as in those exhibited. . . .

"In the use of zinc chlorid as an obtundent of sensitive dentine there cannot be two opinions. The experiments demonstrate, beyond cavil, that this agent for this purpose, is exceedingly dangerous to the life of the pulp, and should be abandoned for that purpose. While it is recognized that the experiments are by no means exhaustive, I regard them as demonstrating the incorrectness of the views quoted, and must further regard them as placing the question on an intelligent basis, and perhaps adding something to our knowledge as to the relative penetrating power of coagulants."

Dr. A. W. Harlan has also been experimenting and we shall anxiously await the presentation of the other side of this subject.

SOCIETIES.

TRI-STATE MEETING.

THE joint meeting of the dental societies of Ohio, Michigan, and Indiana, will occur June 18, 19, 20, 1895, at Detroit, Mich. The dental department of the Detroit College of Medicine and Surgery has been secured for the sessions. Michigan has generously invited her sister states to share her hospitality and be her guests on this occasion. The program contemplates four literary sessions, two half days of clinics, and one half day of "hurrah." This latter will come in the form of an excursion 32 miles up the Detroit River to the St. Clair Flats, where we will dine at one of the club houses built on piles in the middle of Lake St. Clair. Special hotel and railroad rates are assured and will be announced later. The railroad fare will be at least as low as one and one-third fare. All reputable dentists in the three states are cordially invited to attend.

EXECUTIVE COMMITTEE.

MISSISSIPPI VALLEY DENTAL ASSOCIATION.

THE fiftieth anniversary meeting of this society will be held in Cincinnati, in March. An especially interesting meeting is promised and we hope that all dentists who can go will be sure and arrange to do so.

LOUISIANA STATE DENTAL SOCIETY MEETING.

THE meeting of the Louisiana State Dental Society will take place at Tulane Hall, New Orleans, February 26th, 1895, the day following Mardi Gras. The profession is invited to attend.

H. A. TRUXILLO, D.D.S., *Cor. Sec'y.*

THE ST. LOUIS DENTAL SOCIETY.

THE Society elected the following officers for this year:

President, Dr. Walter M. Bartlett; *Vice Pres't*, Dr. M. R. Windhorst; *Cor. Sec'y*, Dr. F. F. Fletcher; *Rec. Sec'y*, Dr. P. H. Morrison; *Treasurer*, Dr. A. J. Prosser; *Publication Com.*, Drs.

L. A. Young, P. H. Eislaëffel, T. L. Pepperling; *Com. on Ethics*,
Drs. Wm. N. Morrison, P. F. Helmuth, O. H. Manhurd.

F. F. FLETCHER, *Cor. Sec'y.*

NEW PUBLICATIONS.

A SYSTEM OF ORAL SURGERY, BEING A TREATISE ON THE DISEASES AND SURGERY OF THE MOUTH, JAWS, FACE, TEETH AND ASSOCIATE PARTS, by Dr. James E. Garrettson. Sixth edition thoroughly revised with additions. Philadelphia: J. B. Lippincott Co., Pub., 1895.

This work on oral surgery holds first place among publications treating on this subject and well it should for a more capable man, in this department, than the author, cannot be found. The present volume, while not having as many pages as the fifth edition, contains more reading material on account of enlarged page and admirable condensation. The author says: "The last book numbered over thirteen hundred pages, while the present one, if printed in the same way, would have reached nearly fifteen hundred. The thousand pages constituting the volume leave out nothing of the old and take in the new. . .

"The book as it stands is an exponent of Oral Surgery; not a part, but of the whole of it. Dentistry must be known if the other parts be known, and these other parts in turn must be known if dentistry be known. That exception is taken by some to introduction of mechanical portions of the text is known to the writer, but finding such matters necessary to be understood by himself and students, he accepts that were they left out the omission would quickly make itself felt."

The work is so exhaustive that it is impossible in our limited space to give the reader an adequate idea of its contents, but suffice it to say that it is brought thoroughly up to date. Many new illustrations have been added to elucidate the text. Dentists in general should make more of a study of oral surgery than they have done heretofore, for the profession is rapidly advancing and the men who keep pace with its requirements are the ones who will remain in the front ranks. We advise every dentist to secure a copy of this work, digest its contents and be prepared to at least make a correct diagnosis of cases that present and to suggest the proper treatment for them. The typographical work is perfect and reflects much credit upon these well-known publishers.

THE DENTAL DIGEST.—The first number of this new monthly has just appeared. It is published by the Dental Protective Supply Co., of Chicago, under the management of Dr. J. N. Crouse. The editor of course you know. Every one knows our genial friend Dr. A. W. Harlan. We most heartily welcome him again into the editorial ranks. The first issue of this journal is a creditable one and with these men at the helm we feel that its success is already assured.

PEARSON'S VEST POCKET APPOINTMENT BOOK becomes a necessity when once used. It is a welcome yearly visitor at this office and remains with us through the season. It is published by R. I. Pearson & Co., Kansas City, Mo., and may be obtained from them or through any dental depot. Price 50 cents.

ANNOUNCEMENT.—The chairman of the executive committee of the Horace Wells Fiftieth Anniversary Celebration, announces that the papers read by Profs. Fillebrowne and Garretson at the meeting and the speeches delivered at the banquet have been prepared for publication in the proposed Souvenir Volume and will be issued upon a sufficient number of subscriptions to cover the expense. Price \$1.50. The undersigned will receive subscriptions, receipt for same and deliver the book upon completion.

J. D. THOMAS, *Chairman*.

912 Walnut Street, Philadelphia.

EDITORIAL CHANGE.—Dr. C. N. Johnson has resigned from the editorial staff of the *Dental Review*. He will be succeeded by Drs. T. L. Tilmer, G. J. Dennis, and T. E. Weeks.

While we regret to see Dr. Johnson leave the editorial tripod, we congratulate the *Review* on having in reserve men so well qualified to carry on the good work.

BOOKS RECEIVED.

GORGAS' DENTAL MEDICINE. Fifth Edition. P. Blakiston, Son & Co., Pub., 1895. Price \$4.00.

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CONTRIBUTIONS.

SIMPLE AND COMPLICATED REGULATING MECHANISMS; ESTHETIC MECHANISMS; PROPER AND IMPROPER ANCHORAGE.

BY J. N. FARRAR, M.D., D.D.S., NEW YORK CITY.

SIMPLE AND COMPLICATED REGULATING MECHANISMS.—In some of my published papers I have dwelt somewhat on this subject; but as there are some *dentists* who persist in efforts to *prejudice students against improvements* in regulating mechanisms, a few more remarks will be made. In mechanics simplicity is the great desideratum with all natural inventors. No useless elements are found in first-class machines of any kind; but it is not everybody who understands this subject sufficiently to comprehend that there can be simplicity in complicated machinery, and that some of the grandest and most valuable machines ever invented are so because of this complicated simplicity. The Hoe printing-press is a startling example of this. More than 16,000 pieces in one machine, printing, folding, cutting, pasting, and filing 96,000 newspapers per hour, is an example of complicated simplicity and a marvellous illustration of the fruits of the genius of man.* The

The editor and publishers are not responsible for the views of authors of papers published in the OHIO DENTAL JOURNAL, nor for any claims that may be made by them.

* The full-size press now in use is composed of more than 16,000 pieces, and weighs 130,000 pounds or 65 tons. Its total length is 26 feet 3 inches; width, 18 feet; and height, 12 feet. It prints upon both sides of three continuous webs of paper supplied from three separate rolls,

true mechanical genius *laughs to scorn* those who attempt to ridicule the best mechanisms ever invented for correction of irregularities of the teeth, calling them unnecessarily complicated, simply because they themselves have not sufficient skill to even copy them. So long as the dental profession contented itself with crude, cumbersome mechanisms, no progress was made in this branch; but when higher mechanical skill was applied it advanced and continued to advance as more and more thought was centred upon the subject, until now it has loomed up as one of the grandest of all the branches of dentistry. Indeed, it has reached a standard that never could have been attained from the acceptance of the views of those persons who are always to be found pulling back until dragged forward by public sentiment. In my office there are hundreds of mechanisms many of which may at first seem to the tyro to be more complicated than is necessary; but there is not one that is really complex to an expert. Those which at first appear so are only examples of complicated simplicity that operate as easily as the turning of a screw. There are in vogue old fashioned regulating mechanisms, consisting of plates and springs, match-sticks and strings, that *are* complex. These are not only difficult to manage, taking unnecessary time and causing great pain to change the strings, but impossible to be kept clean. With a lot of such things matted with decomposed food, no patient can feel happy over an operation.

True mechanics recognize any mechanism as simple that can be operated easily and will accomplish the result desired. Anything that requires great care and unnecessary time to manage is regarded by them as an imperfect machine. In other words, a regulating mechanism, if difficult to manage and painful to endure, must be regarded as more complicated than one (though requiring manipulative, mechanical genius to contrive) that will, when properly finished and applied, be managed easily and quickly, without causing pain. The former is *low mechanics*, the latter *high mechanics*.

splits the webs longitudinally, brings the narrow webs into one or several groups, serves the webs collected transversely into sheet lengths, unites the sheets by pasting, folds them, and delivers perfect newspapers composed of many sheets, bound together, cut open at the head and counted. It can print 96,000 four or six page papers, 72,000 eight page papers, 48,000 ten or twelve page papers, 36,000 sixteen page papers, or 24,000 fourteen, twenty, or twenty-four page papers per hour.

ESTHETIC MECHANISMS.—Another phase of high mechanics, as applied to dentistry, is the esthetic. Failure may arise from lack of skill on the part of the operator or by perversity of the patient. But many failures can be traced solely to the disgust of patients through lack of esthetics in the mechanisms; because conspicuously black and filthy mechanisms do not encourage the patients. There have been many failures, by the use of such things, that would have ended in a glorious success if delicately and beautifully made gold mechanisms had been used.

ANCHORAGE PROPER AND IMPROPER.—When the first molar has been extracted it becomes necessary to use the second and third molars for anchorage, to move back the bicuspid; but they should not be drawn upon for moving more than one tooth at a time, and even then these anchor teeth should be frequently examined to prevent too great inclination forward. If they have moved too far, they should be given liberty, permitting them to return to their normal positions. It should not be inferred from this, however, that the starting forward only a short distance is dangerous to these teeth, as all anchor teeth are liable and even expected to be moved somewhat by the draught. The question to decide is, how long such started anchor teeth can be safely used to further the operation. If the antagonism is not broken too much these teeth will generally settle back into their former and normal places, even if they are elevated slightly in their sockets. If elevated, however, it may require months. Because of this natural tendency to settle back and down into the sockets it is *not prudent* to be in too great haste to *grind teeth* to improve antagonism after having completed the operation of moving teeth.

In planning a mechanism for moving teeth, one of the main points to be taken into consideration is enduring firm anchorage. In my own practice I always include for anchorage all the teeth that are practicable, not only to prevent their being moved, but also to prevent soreness of the sockets. The exceptions to this rule of practice are in cases where a sufficient number of teeth cannot be taken advantage of for anchorage, or where it is necessary to *move anchor teeth forward to aid in filling extra space*.

ODONTALGIA.*

BY N. S. HOFF, D.D.S., ANN ARBOR, MICH.

SEVERAL years ago, when I was younger in professional life, an older practitioner proposed as the subject for consideration by our local dental society, "What would you do with a case of toothache?" I was surprised and somewhat indignant, that he should refer to this malady in such indefinite and unscientific terms, and especially to invite a society of professional gentlemen to discuss it.

During the past two months I have apparently lived in an atmosphere of toothache. It has seemed to me there was no disease so common, or one which presents so many vexing problems, or brought me so many patients. Living in a college town, I have had toothaches from almost every state and territory in the union, Canada, Germany and England, presenting almost as many varieties as patients, and when your executive committee invited me to write a paper for the meeting and refused to assign me a subject, I could not get away from toothache, and shall take pleasure in unburdening my mind even if I do bore you.

It is exceedingly difficult to define odontalgia satisfactorily and comprehensively without qualifications. In the mind of the laymen it covers all diseases of the teeth and associated parts, especially when painful. But the dental practitioner will associate the disease with numerous functional disturbances of the dental organs and tissues. The word toothache to him is comprehensive but not definite.

In the *American Journal of Dental Science*, for July, 1853, I find an article on odontalgia, by J. P. Fogg, M.D., from which I shall quote the opening paragraph for the graphic and forcible way in which it describes the malady, and for its historic interest and as an introduction to my theme.

"The simple definition of the technical term odontalgia, is to be found in our vernacular word toothache. No theory whatever is implied in it. It simply means what it emphatically is, *a pain in a tooth*. The character of this pain is protean. It may be a slight uneasiness, it may be an intolerable anguish. It may

* Read before the Ohio State Dental Society, December, 1894.

be dull, heavy, constant like rheumatism, acute and lancinating, paroxysmal, darting, boring, throbbing. Any term of the frightful vocabulary of human suffering may be applicable to this torture. It may be culminative, beginning moderately and increasing to intense severity, or it may at once attack the sufferer, armed in all its terrors. Yet toothache is, after all, only a symptom of some lesion, either in the pulp, the tooth, the jaw, the nerve, the brain, or the system at large."

No authoritative classification of the different phases of odontalgia will admit of a brief and comprehensive consideration, such as may be necessary to properly present the subject at this time, and I take the liberty of condensing the accepted classification and considering it under five headings simply for convenience.

First: Exposure of the dentine by accident or caries.

Second: Exposure and disease of the pulp.

Third: Disease of the peridental tissues.

Fourth: New growths in the pulp tissue or upon the roots.

Fifth: Reflex irritation.

Just why exposed dentine causes pain in the tooth we do not at present so clearly understand, as that it does. Clinical experience has practically established the fact of a wide difference in the susceptibility of dentine, when exposed in different patients, to pain. Very slight exposures will cause pain in some persons, while extensive exposures in others will cause little or no pain. It is also true that at different periods exposed dentine is more likely to cause pain in the same persons, and accidentally different teeth in the same mouth may manifest differences in the degree of sensibility. The old writers accounted for pain or sensation in the dentine on the theory that it was subject to inflammatory processes. But on account of the absence of the essential elements of inflammation, this theory is not now believed. Some authors think the dentine is endowed with sensory nerve fibers, although they confess their inability to demonstrate their existence, or to trace any connection between the nerves of the pulp and the dental fiber or organic tissue of the dentine. Bödecker in his recent work, *Anatomy and Pathology of the Teeth*, page 272, says: "It is impossible to admit of the existence of a connective tissue holding nerves alone in its constituent soft parts. Neither have we, nor has Retzius in his recent investigations, been able to trace a

direct inosculation of the dentinal fibrillæ with the axis fibrillæ of the nerves so abundantly distributed throughout the pulp tissue. As soon however as we admit that the dentinal fibrillæ are formations of living matter, the same as are the nerves, all difficulties vanish in explaining the transmission of sensation from the periphery of the dentine to the nerves of the pulp tissue. Living matter is contractile. Nerves are made up of living matter, and owing to their reticulated or beaded structure are fittest for that transmission of contractions from the periphery to the nervous centers which we call sensation. Contraction of the dentinal fibers transmitted into the reticulum of protoplasm at the periphery of the pulp, and thence into the ultimate nerve fibrillæ, —all of which formations are proved to be continuous,—is sufficient to explain the transmission of sensation, or speaking bluntly, of pain."

This theory whether we can accept it entirely or not, is as satisfactory as any other and has much to cause us to accept it. It is plausible and harmonizes with clinical experience and manifestations. The application of agents capable of producing contraction in protoplasm and organized tissue elsewhere, we find produce pain when applied to exposed dentine; such as cold, excessive heat, escharotics, caustics, and other chemical and mechanical irritants. All successful treatment of exposed dentine depends upon its being protected mechanically or by narcotic and anesthetic drugs, from the irritation of these agents, or upon the disorganization of the organic tissue in the dentine so that irritants produce no impression when applied. It therefore seems clear that the theory is worthy of confidence, and all principles for treatment of sensitive dentine and from the relief of pain from exposure of the dentine should be based upon it until some one demonstrates its error or gives us a more plausible one. The technical resources for the cure of toothache from this cause are so various that any attempt to detail them here, would be a burden. We rest our practice on the acceptance of the contraction theory, leaving to individual cases the selection of procedure and remedy.

The second division of our subject, *Exposure and diseases of the pulp*, presents a different and more complicated series of conditions, requiring prompt and definite treatment, as the symptoms are frequently manifested with great energy, because of the pecu-

liar environment of the pulp and its sensitive nature. The pulp is richly endowed with blood vessels and nerves contained in a matrix of connective tissue. There are lymphatic canals and possibly lymphatic glands. There are few arteries and veins, and these are near the center of the pulp, but the entire organ is richly supplied with blood capillaries, especially toward the periphery. The odontoblast layer on the periphery of the pulp is not highly sensitive, but the granular layer immediately beneath contains the nerve endings of the pulp nerves and is highly sensitive. Irritation of the exposed pulp is followed by pain, depending on the character of the irritant as to its penetrating power and the severity of its action. Mechanical and galvanic shocks cause prompt and severe pain; and because of the favorable structure of the pulp the shock is quickly experienced not only in the pulp, but in the general sensorium as well. Chemical irritants act more slowly, depending on their relative solubility. The power of their impression will depend upon their characteristic physiological or chemical affinities. The pain produced in each case will correspond with the time and intensity of the irritation. *Irritation of the pulp* is always followed by disturbance of its normal circulation. The first effect is to produce contraction of the tissues and more or less anemia, which is quickly followed by relaxation and a determination of blood to the part, congestion and incipient inflammation. This condition is scarcely pathological, and yet it requires very nice manipulation, and the proper selection of remedies to prevent serious inflammatory conditions following. Prompt removal of all irritants and provision for complete seclusion, accompanied by the application of local vascular and nerve sedatives. Disinfection with non-cauterant germicide, the application of an antiseptic dressing and the careful adaptation of a protecting filling, are indicated for the relief of the pain and its subsequent recurrence.

Inflammation of the pulp, results from inoculation under conditions of general systemic infirmity, or because of excessive exposure, and irritation in consequence of mechanical, chemical or physical excitants. There are the usual symptoms of irritation and in addition the entire pulp takes on a persistent congested condition, which in a measure suspends the normal function of the pulp. There is pain, not only of the acute variety, but the tissues themselves take on a kind of lameness or hypersensitive

condition, so that every pulsation of the heart is distinctly felt, causing intense and prolonged suffering. This condition is not amenable to treatment with the ordinary local remedies used for pulp irritation, at least not for curative results. The results of this affection are somewhat varied and the prognosis is uncertain. Usually it means the utter annihilation of the pulp as a vital organ. In favorable cases; good systemic health, youth, and the absence of destructive infection, the chances of successful conservative treatment are correspondingly better. In many cases it is practicable to save the pulp even after extensive inflammation. It is of the utmost importance that the actual condition present should be carefully determined, in order that needed and useful pulps be not sacrificed indiscriminately on principle. And also to prevent needless suffering for the patient in a futile attempt to save pulps which ought to be subject to radical treatment at once.

The treatment of this condition for the relief from pain temporarily, can in almost every case be successfully accomplished by the removal, as far as practicable, of all local irritants; the application of astringent, non-irritating sedatives; an antiseptic dressing to be covered with such material as the case will indicate, to prevent further irritation and the dissipation of the dressing by solution in the saliva. Counter stimulation of some of the systemic eliminating organs to withdraw the excess of fluid from the pulp, such as a saline cathartic. If this is not advisable a heart sedative will give temporary relief and enable the tissues of the pulp to recuperate and secure a more normal circulation and function. After the inflammatory condition has subsided, the pulp may be covered with a suitable non-irritant filling material and the carious cavity filled with a more resistant material, one that may be removed without applying excessive force in case of a reappearance of the difficulty. The conservative treatment of pulps so diseased will necessarily depend so largely upon individual conditions, that it would be impracticable to even suggest a treatment for the varied conditions which must be met. The condition of the pulp itself, as to the character and extent of the disease; the personal idiosyncrasies of the patient as to general health; the difficulties of exact technical manipulation; the importance of the individual tooth and the subsequent service required of it, are to be taken into consideration. Placing crowns, bridge attachments, regulating appliances, or requiring constant

and heavy service in any way, will be likely to thwart all efforts for the conservative treatment of teeth having had inflamed pulps. If any such service is to be required of a tooth soon after treatment, it will be better to destroy the pulp at once and avoid almost certain secondary inflammation. If the indications are that there is extensive inflammation of the pulp and it is desirable to insert cement or amalgam fillings, or even gold fillings, it will save much inconvenience and suffering to destroy and remove the pulp at once.

The third stage in exposed and diseased pulp is what is sometimes called gangrene of the pulp. We may have gangrene of the entire pulp or only of the exposed surface. Where the exposed portion of the pulp only is involved, it takes the form of a slough, with little or no pain except when irritated. This condition is not always the cause of severe toothache, but is sufficiently troublesome to require attention. The indications usually are for entire destruction of the pulp, but a few conservative practitioners recommend excising the diseased portion, and by palliative treatment save the remaining portion. In my own hands this procedure has never been successful in permanent results. The most painful form of pulp gangrene occurs when the pulp is inclosed in the pulp chambers by fillings or debris of caries. The generation of gas in the putrefactive process creates great pressure and consequent irritation of the nerves of the pulp and may extend to the periosteum. The pain is continued, severe and somewhat vasculating, owing to thermal changes experienced through the tooth. The pulp is highly congested and if the cause of the irritation be not removed inanition and dissolution follow. Conservative treatment of such pulps is not advisable, but the excessive pain can be reduced by making an opening directly into the pulp chamber to allow the gas generated in the putrefactive process to escape. After which the pulp can be anesthetized and removed entirely. The root canal should then be sterilized and filled and also the carious cavity of the tooth. It is sometimes difficult to locate the affected tooth as there may be no complication with the peridental membrane, and because of reflex irritation the pain will be manifested in another tooth, or in associated organs; the eye, ear and face. Testing suspected teeth with extreme heat or cold will result in exaggerated symptoms when the affected tooth is tested. The heat serving to expand

the gas which results from putrefaction and as it can not escape from the pulp chamber it makes pressure on the inflamed tissues and consequently pain. In the same tooth the application of cold will cause pain at first by shock, but immediately relief will come because of condensation of gas and relief of pressure, and also because of the fact that contraction of the tissues by shock forces the fluid out of the pulp chamber, and restores the tone to the blood vessels. If suppuration has not yet set in, and still there is excessive inflammation, the application of cold will produce or create pain, not only by shock, but by its stimulating effect through the vaso-motor system upon the collateral blood circulation, throwing more blood into an already congested pulp which has no room for expansion. The use of heat in such cases will relieve by lowering the blood pressure in the collateral circulation and consequently depleting the pulp. It is evident to everybody, especially one who has tried these agents for this purpose, that great care should be exercised in their use, especially to confine them as much as practicable to a single tooth at a time. But careful use of them will result in the most accurate information. Percussion may aid some, but has no special value unless there be periodontal inflammation. Putrefactive changes may be determined by difference in resonance. Reflected light will often be of service in noting the difference in opacity. The history of the case will frequently suggest much that will be of value. An accurate diagnosis will suggest the treatment without great difficulty. As an expedient, extracting the offending tooth, this would be a radical measure indeed. Conservative treatment would in such cases be along the line of saving the tooth without the pulp as this organ in this condition is entirely beyond any medical treatment. The first step will be to gain access to the pulp in order to effect its removal. Sometimes it is impracticable to do this because of circumstances, proper instruments are not available or the patient's health will not admit of so painful an operation as drilling into the canal through a dense tooth or hard filling. General or systemic remedies will be indicated in such emergencies, systemic narcotics, combined with drugs which will depress the heart's action directly, or lower the blood pressure by acting upon the arterial system, or depleting the blood with diaphoretics, cathartics or diuretics. Dover's powder as a narcotic and diaphoretic will answer generally* together with a warm foot bath, a reclining

position, and in aggravated cases a heart sedative, such as aconite. A warm poultice applied over the region of the affected tooth will relieve congestion and prevent pericemental irritation. If it is possible to secure free access to the pulp at once, the treatment is much simplified. The disorganized tissue should be thoroughly cleared away by syringing the cavity with warm water, the rubber dam put in place to isolate the tooth, and pulp injected with a solution of cocaine and thoroughly removed. If there has been no suppuration to infect the dentine or peridental membrane, the tooth may be sterilized and filled at once. If gangrene has taken place it is better to make a dressing of a disinfectant and defer filling the canal to a subsequent sitting.

The fourth condition of exposed and diseased pulps is a somewhat rare one. *Tumefaction*, except in rare instances is merely hyperplasia or excessive growth of the basis substance, or the growth of the basis substance of the pulp until it protrudes from the exposed orifice of the pulp chamber. This condition is not painful except when specially irritated, and the season of pain is not prolonged. The nerve supply is scant but the blood supply is abundant. It is simply a pathological tissue and is incapable of being restored to its normal condition and function. Its destruction is always indicated. This can best be done by anesthetizing it with cocaine and removing by an operation. Cauterizing chemicals produce intense pain in it and can not be used. Actual and galvanic cautery may be employed, but they are more or less painful and the manipulation of such cauterants is difficult.

Toothache from disease of the peridental membrane is not uncommon. It frequently has an intimate relation to diseases of the pulp, already considered. In fact the majority of diseases of the peridental membrane which cause toothache are the result of destructive inflammation of the pulp. This organ is easily inoculated from a diseased pulp, because of the intimate relationship of the two organs. Its environment is similar to that of the pulp, its nerve supply is not so rich, but it has a very liberal blood supply. When congested by inflammation it thickens and lifts the tooth in its socket, so that unusual pressure and percussion from the occlusion of the teeth serve to exaggerate the already irritated tissue and consequently it becomes exceedingly painful. If the affection is mild in type and acute, it may not cause great inconvenience, but is exceedingly painful when struck. It is some-

times produced by mechanical and external irritants, such as blows, over-malleting, regulating, wedging, application of clamps, etc. In such cases recovery will be prompt after the removal of the cause of irritation. If the cause be infection from an inflamed or suppurating pulp, or the forcing of the debris of a putrid pulp through the apical foramen of the root, or the continued action of irritant or caustic chemicals, a serious inflammatory result may appear, varying in all degrees from irritation to suppuration and infection of the contiguous tissues of the jaw and face correspondingly and variably painful. In the beginning of inflammation of the peridental membrane the tooth elongates because of congestion, pressure on the tooth produces pain, as the inflammatory process succeeds the pain increases and changes from tenderness to acute pain and then to a throbbing or jumping character. There seems to be a more powerful heart beat, and if the patient exert himself the rapidity of the action is increased. If suppuration takes place there is general pyrexia and nervousness, and the patient is exceedingly uncomfortable.

The treatment of incipient and acute pericementitis due to inflammatory action set up because of its association with an inflamed pulp, would of course depend upon the treatment of the pulp. The removal of the irritated pulp and the local application of counter-irritation will be sufficient to cause it to subside. But when the peridental membrane itself has become affected by inoculation and a destructive inflammatory process has been set up in it a more difficult disease for treatment is encountered. Sometimes its course may be aborted by the continuous local application of counter-irritating blisters, and systemic depleting and disinfecting remedies, saline cathartics and antipyretics. Too often the disease must run its course to suppuration. When this is the case all possible means for hastening the process should be employed. The most effective being poultices of, various substance to keep the parts warm and moist, thus assisting in the production of putrefactive agencies and the relaxation of the resistance power of the tissues molecularly. So that the pus shall be formed quickly in sufficient quantity to burrow its way through the tissues toward the surface, when by the use of the lance it may be drawn off and with it much of the active agency causing the inflammatory condition. The releasing of the pus will usually give immediate relief. Little further medication is

indicated, except to keep the sinus made by the pus, open and clean. This should be done with warm water containing some active germicide in solution, until resolution has taken place. If the abscess has been of long standing and there be necrosis of the bone, its removal is indicated as is also the use of local stimulating remedies.

Calcific growths in the pulp chamber and on the roots of the teeth are a more frequent cause of pain than we realize. The symptoms are not so markedly manifested as in inflammation of the pulp or peridental membrane. The pain is not severe nor acute, but is more continuous. Calcific deposits in the matrix of the tooth pulp, are due to the irritation of the pulp through exposed dentine or cementum from caries, abrasion or recession of the gums. No inflammatory process takes place in the pulp, but an abnormal functional excitement, due to this external irritation through the denuded dentine. When these deposits form in the connective tissue of the pulp or on the walls of the dentine no excessive pain is experienced. But it frequently happens that owing to a hyperemic condition of the pulp, these formations take place in the capillaries or in the nerve tissues producing considerable pain. The pain in such cases may be slight in the tooth itself, but by irritation of the reflexes pain is manifested in other, even somewhat remotely situated tissues, such as the eye, ear, the shoulder, the sides of the body, etc., but generally facial neuralgia, which is difficult to locate as the teeth and muscles of the face and throat are all more or less implicated. The diagnosis is difficult as there are no apparent local symptoms. Teeth with large cement or amalgam fillings should be carefully inspected, also teeth largely denuded of enamel, dentine or cementum. Heat and cold will reveal hypersensitiveness and may, by exaggerating the paroxysms of pain disclose the affected tooth. The treatment is radical, either the removal of the pulp or extraction of the tooth. Secondary deposits on the roots of teeth are not frequent causes of pain. They are common in advanced age, especially where there has been considerable disease of the peridental membrane. The exact cause of the disease is not well made out and it is much a question whether the process in itself is a disease at all. It is not painful, but has by some authorities been supposed to have much to do with those obscure facial neuralgias which can not or have not been traced to other sources.

The treatment must be preventive, in relieving all irritable condition of the peridental membrane, or radical extraction of the teeth.

Reflex irritations are important factors in medical practice, and more or less attention has been given to these affections by dental practitioners. They are exceedingly difficult to diagnose by the dental practitioner, because an irritation in a very remote part of the body may manifest itself prominently in a dental organ with no evident cause. Diseases of the eye, ear, nose, throat, brain, cord the thoracic, abdominal and pelvic viscera, to say nothing of many constitutional diseases such as malaria, gout, syphilis, etc., are liable to be the cause of localized pain in and about the dental organs. These reflex irritations of the teeth frequently show themselves in perfectly sound teeth, but more frequently a tooth structurally weak from some cause will be the one selected. The treatment of the affected tooth may give relief, but many reported cases seem to indicate that extraction of the tooth is the only adequate cure. The treatment of these conditions are one of the points at which the dentist and physician should act together. Many serious mistakes have been made because of too much specialization. There is no question but that diseases of the dental organs cause and continue many serious nervous and organic systemic affections in spite of the best medical treatment. But this is not our subject.

There is one cause of tooth ache that I have been unable to classify, because I do not understand it and can't find any authority on the subject. As near as I can state it, it is acute irritation without destructive inflammation of the peridental membrane. It generally follows the removal of the pulp by either operative procedures or chemical corrosion and the immediate filling of the root. Especially is it present when irritating chemical germicides or antiseptics have been used to sterilize the root canal. It sometimes follows the treatment and capping of exposed pulps and insertion of fillings. I am not able to briefly outline the symptoms, except to say that there is pain usually without soreness, although soreness may be present. The pain is more or less constant. If from a capped pulp it is sometimes neuralgic. It certainly is irritation of the nerves of the dental tissue surrounding the tooth, but of what nature I am unable to determine. It is exceedingly practical in its bearing on this subject and is be-

coming more prominent as the use of rapid destruction and anti-septic treatment of pulps increases. My notion is that it is a secondary effect of the use of irritant anesthetic or germicidal drugs.

DISCUSSION.

DR. H. A. SMITH: I remember at a meeting of the Mississippi Valley Dental Association which I attended a long time ago, Dr. Watt suddenly asked Dr. Atkinson what he would do in a case of toothache? Dr. Atkinson hesitated a moment and then replied, "Show me the case."

If we want to receive any benefit, practically, from this discussion, so I would say—show us the case. The patient applies to be relieved of pain, and in order to give relief promptly, a correct diagnosis is all important. To do this properly, especially if we need to make a differential diagnosis, requires more time than is usually given by the busy practitioner. For example, let us take a simple case of partial acute pulpitis, caused by caries. We assume the pulp is exposed. In order to apply the remedy the cavity must be carefully excavated, washed and dried, and then some one of the usual anodyne remedies applied. Following this treatment a stopping should be placed in the cavity, in a way to avoid pressure on the pulp. If the hyperemic pulp is to be relieved by depletion, the puncture should be preceded by applications of cocain. Now all this, as I have said, requires more time, unless an emergency case, than can be taken from our patient already in the chair. Would it not be better, more satisfactory, to both the patient and dentist, to reserve the case for our consultation hour, or reserve sufficient time for careful treatment, on appointment with the patient.

Doctor Hoff has treated the subject in a general way quite exhaustively. The classification he makes of pulpitis is similar to that which Bödecker gives in his recent work, and from a clinical standpoint seems very satisfactory.

I cannot do better in closing, perhaps, than to commend Doctor Bödecker's book *Anatomy and Pathology of the Teeth*. This work embodies the scientific investigations and experiences of a busy and accomplished practitioner during a period of twenty years. To the thoughtful and intelligent dentist the study of Dr. Bödecker's book cannot fail to be largely helpful in the routine of daily practice. May I add it is a matter for congratulation that this able work is the product of a dentist pure and simple, Doctor Bödecker has only the degree of Doctor of Dental Surgery.

SHEDDING THE TEMPORARY TEETH.*

BY J. TAFT, D.D.S., CINCINNATI, O.

IN attempting to present some thoughts on this subject it is not with the same confidence that many others would be approached.

It has always been regarded by physiologists, and indeed by all who have made it a subject of study, as one of nature's obscure processes, one that its full elucidation has escaped the investigations of not only the physician, but the dentist as well, and this notwithstanding it is his special province to investigate all questions pertaining to odontology.

To all questions pertaining to the teeth the dentist is expected to give special attention, and go further into the mysteries pertaining to them than others whose studies and investigations necessarily have a broader scope.

The dentist should have as thorough knowledge of all that pertains to the teeth—their development, growth, use, diseases, affections and susceptibilities as possible, in order that he may best secure the welfare of those committed to his care.

This subject of shedding the temporary teeth, is one that in no small degree influences the development and arrangement of the permanent teeth.

It may be well before going further, to note the condition of the child at the time of the development of the teeth, and the purposes they are intended to serve.

The rudiments of the deciduous teeth are formed at an early period of intra uterine life, and progress on to the perfected state, complete within from three to four years. The teeth unlike other parts of the body are formed in a comparatively brief period, and neither increase or diminish in size. They are then in condition to perform their functions fully.

When the conditions are normal this is the time of life when a change is required in the form of food, from the fluid to the more solid condition; a condition requiring mastication and insalivation. This is a necessary process preliminary to proper digestion.

*Read before the Ohio State Dental Society, December, 1894.

The jaws as a whole, and especially the parts occupied by the temporary teeth, grow rapidly after the completion—full eruption—of the deciduous teeth, and especially if their work of mastication is well performed. If, however, there is deficiency in this respect, there will be a corresponding slowness in the growth of the jaws.

Where the teeth during infancy and childhood are properly used in mastication, the jaws will have a normal growth, which will usually be shown by the separation of the teeth, especially the six anterior teeth. This separation is far less frequent with the teeth that have been little or not at all used in mastication. The proper use of these teeth is a stimulus to the process of nutrition in the parts about them.

In those cases only, in which the teeth are rightly used, will there be a good, vigorous, nutrient action. Under such circumstances it is not only the jaw, the living structure in which they stand, that receives the benefit, but the teeth that are thus used are better nourished, stronger, and better resist disease.

But, perhaps, of more importance than this, is the active, nutrient supply thus given to the growing permanent teeth, that are as yet enclosed in appropriate cavities in the jaws.

The periosteum of the temporary teeth and of the permanent, so far as their roots may be formed, partake of the same beneficent supply.

The tissue or organ that is to be the active agent in the removal of the roots of the temporary teeth, is also better formed or developed, and will be in better condition for its appropriate function, when the time arrives for its operation.

The temporary teeth are designed in the human organization to have but a brief existence, having an active service of from five to seven years, upon an average.

At the end of this period, they are by a beneficent and *purely* physiological process removed, this is accomplished by the removal of the roots of these teeth. When the process is without interruption or interference the roots are fully removed, or sufficiently so to permit of the removal of the crown by the ordinary movements of the jaws, the cheeks, lips and tongue.

The manner in which, and the agency by which, the roots of the temporary teeth are moved have afforded ground for various opinions.

The subject has not been much discussed in recent years. The writers of a quarter of a century ago or more gave much more attention to it than those of recent times. Whether this state of affairs has existed because of the difficulties attending its investigation, or because it was supposed or assumed that it had been exhausted, I will not venture to assert. Perhaps it was because subjects more inviting were presented. It may, however, be said that the process of shedding the teeth is not generally understood, it is therefore a subject that should be further considered.

Various theories have been put forth in the past, as to the manner in which this removal is accomplished.

In the early periods of medical science many supposed that the temporary teeth had no roots. Others advanced the theory that the crowns separated from their roots in the same manner as the horns of a stag fall off, and that from the root the new tooth sprang. Fouchard and Bourdet suggested that the roots of the temporary teeth were removed by the action of a solvent fluid.

Bulow advanced the theory that they were worn away by the advancing (rising), tooth.

Lecluse suggested that when the process of their removal begins their vessels cease to supply the nourishing juices, and that they are broken up by a species of maceration; and Jordan believed it is accomplished by abrasion and corrosion.

Fox attributes it to the pressure of the crown of the permanent tooth upon the root or roots of the temporary; but he afterwards admits that it frequently occurs without such pressure, and further remarks: "These circumstances seem to prove that the absorption of the fangs of the temporary teeth is an action of nature sometimes independent of pressure; and it is a very singular circumstance that at a time of life when so great a quantity of ossific matter is poured forth from all the arteries concerned in the formation of bone, in one particular, there should thus be an absorption of this substance taking place."

Bell rejects the theory of pressure, and attributes the removal to the action of absorbent vessels.

Laforge observing a fungiform or fleshy substance behind the roots of the temporary tooth, supposed this to be the agent actively engaged in the removal of the temporary teeth.

Bourdet observing essentially the same thing, came to the same conclusion, namely, that a fluid was exhaled from this substance which possessed solvent properties, he gave it the name of the "Absorbing Apparel," and regarded it as the active agent in removing the roots of the temporary teeth.

Delabarre investigated very fully this subject. He corroborates the views of Laforgue, and gives the following description of the manner of the formation and function of this absorbing organ :

" While the crown of the tooth of replacement is in process of formation the exterior membrane of the matrix is simply crossed by blood vessels, but as soon as it is completed the capillaries are then developed in a very peculiar manner, and form a fine tissue. From this tissue the internal membrane instead of continuing to be very delicate, and of a pale red color, increases in thickness and assumes a redder hue. As has been said, it is at the instant in which commences the reaction of the coats of the matrix, that are conveyed from the gum to the neck of the teeth, that the fine vessels enter the tissue, thus composing a body of carneous, flesh like, appearance. It is therefore the dental matrix itself, that without being dilated to serve as a protecting envelope, is contracted to form not only its bud-like body, which we find below the temporary tooth when it is shed, but also a carneous mass by which the whole is surrounded."

He then asks, " Is there an absorbing fluid that acts chemically on the surrounding parts, or do the absorbents, without any intermedial, destroy everything that would obstruct the advance of the permanent teeth ? "

In reply to this he says, " Not possessing positive truth to guide me in the decision of this question, and finding those of others of little importance, I shall not attempt to give answer."

These views would seem to approximate more nearly a correct solution of this process than those before referred to, though there are some features of this process which all writers state have not been clearly understood. And while there are questions not now fully comprehended, there are certain points, we think, which may be regarded as settled.

And first we have no hesitancy in stating that the process of shedding the temporary teeth is a purely physiological one; though it has been suggested by some writers, of later date than

those referred to, that inflammation in a more or less marked degree, is present during the accomplishment of this work. This we cannot accept as yet proven; and may state that in a great majority of cases there is no indication whatever of inflammation, or even special irritation. It is true that oftentimes local disease of more or less marked character is concurrent with shedding the teeth; but that it occurs as a necessary result of the removal of the roots of the temporary teeth, we think, there is no evidence.

In the plan of the human organism the temporary teeth are to be displaced to make way for the permanent; and it would seem to be unreasonable that diseased action, even in the mildest form, should be called in to aid in the accomplishment of this work. Disease never occurs without some violation of physiological law.

Again, it is admitted by all intelligent observers that this work is accomplished by the solution of the material to be removed; and this cannot be accomplished without the intervention of a solvent. The debris from the wasting structure is absorbed and carried away through the proper eliminating channels. In order to be absorbed, and thus disposed of, the material operated upon must be in absolute solution.

Third, the fact that is clearly shown by intelligent observation is, that both the organic and inorganic constituents of the cement and dentine are simultaneously removed. An examination of the wasting surface does not present a softened condition, as is shown in decay of the teeth, and as would be shown here if the inorganic material was first removed; nor is there a chalky condition of the wasting surface, as would be shown if the organic constituents were first removed.

We are, therefore forced to the conclusion that the agent concerned in the removal is one having an equal action, so far as its solvent power is concerned, upon both the organic and inorganic constituents.

There are certain uniform features in the accomplishment of this process that indicates quite clearly the fact that it is governed by true physiological law. This is shown by its operation at about a uniformly given time, and by its operation upon certain pairs of teeth.

This manifest law rules out inflammation or any diseased action as a necessary factor in the process.

The removal of the roots of the temporary teeth has definite periods for its accomplishment ; which is always carried out according to the plan, when there is no diseased or abnormal condition present. Neither inflammation nor disease of any kind is uniform in its attack or mode of operation.

The removal of the roots of these teeth is accomplished in nearly all cases without any indication of disease, either in appearance or sensibility. Hence the conclusion is well nigh forced upon us, that the removal of the roots of the temporary teeth is by a purely physiological law ; and that disease in none of its manifestations is a factor, even in the slightest degree, in its accomplishment.

A fourth point, recognized by all close observers, is that the surface of the root being acted on is always in opposition to the corresponding and approaching permanent teeth.

Fifth, there is always found an intervening soft, highly vascular tissue between the permanent crown and the temporary root during the time of the removal of the latter.

Sixth, these hard surfaces are never found in contact when in a normal condition.

Seventh, the root of the temporary tooth is not removed when the crown of the permanent is absent, or its growth arrested, or is situated at considerable distance from the root.

Eighth, the root is not removed by this absorbing process, in the absence, from whatever cause, of this intervening vascular body or absorbent organ.

This organ is in some cases, though rare, never developed. In other cases it is destroyed by disease. In either case the root is not absorbed ; and this even though the permanent tooth may grow and be erupted, when usually the permanent tooth is made to take a wrong position.

DISCUSSION.

DR. KEELY: This paper has interested me a good deal and had I noticed the program before I came here I would have been pleased to have brought my models with me to demonstrate and prove my assertions. Dr. Taft shows that the loss of the temporary teeth has a great deal to do with the position of the permanent teeth. This is a subject in which I have taken much interest and to which I have paid much attention for years, and whenever an opportunity afforded I have taken models to demonstrate my position, and fortunately my father did the same thing

years before me. A great mistake that is made by dentists is in removing the temporary teeth, especially the molars and cuspids. Our little patients are brought to us with these teeth aching and parents want them out; their children have been suffering; they have lost sleep from the effect of it and any persuasion you can use will hardly convince them that the tooth ought not to come out. They should not be removed for this reason. The removal of the temporary molar before the sixth year molars are in contact is a mistake. It causes an early eruption of the first molars and they will invariably go forward so that when we have the eruption of the bicuspid we have them erupting inside the arch, or outside, or both. The same may be said of the cuspids. I have models to demonstrate this. I know that parents bring their children to you, especially about the time the lower permanent centrals come in. They are sure these temporary teeth should have more room. They say, those teeth are crowded, can you take them out? and you answer, if I take them out the permanent teeth will come forward and spread out. Soon we have the eruption of the laterals in the same position. The permanent teeth have come forward and are in contact with the cuspids on each side. Now what effect do we have? The temporary cuspids prevent their coming forward. Suppose we remove that temporary cuspid, the lateral will come forward of course. When the first bicuspid comes in it is in contact with the lateral. Where is the cuspid to come in? It comes in on either the inside or outside of the arch and I think it will do so in every case and am sorry I have not models here to demonstrate and prove it.

DR. BARNES: As far as what Dr. Keely has said, I want to emphasize it, but I will take exceptions to only the last statement. I think if I had heard that statement a week ago I would have agreed with him in toto, but I saw a case only last Friday in which the cuspid came inside the others.

DR. KEELY: I said either inside or outside.

DR. BARNES: There is another case. Dr. Taft speaks of the eruption of the permanent teeth and the cushion between the permanent and temporary. We sometimes have trouble there when the pulp of the temporary seems to be alive. It has been suggested to my mind that perhaps the trouble arising there was due to a real obtrusion of the temporary teeth and I thought if we would take a sheet of wax and place it over the temporary teeth perhaps we would be able to relieve that instead of destroying the pulp as we sometimes have done in various ways. I throw this out as a thought, and if any one has had any experience in that line I would like to know about it, as it is very troublesome as far as I am concerned.

DR. SNYDER: As far as I can understand Dr. Taft's paper, I agree

with the process and I have given some attention to these peculiarities. I have stopped studying about it, as I think the Creator has fixed things in just right. He takes care of those little teeth, and he takes care of the little root and dissolves it away and disposes of it and the crown has got rid of without any trouble.

DR. —: Nature takes care of the living tooth, but what becomes of the dead tooth?

DR. KEELY: I know it is very difficult to convince the parents that these temporary teeth ought to be saved. They ask, why do you want to save it? it comes out after awhile? I answer, how will the child eat and live? These teeth are as necessary for masticating food for the children as permanent teeth are for grown persons, and I refuse to take those out except as a last resort. I have a boy who is now six and a half years old. I commenced filling his teeth when two and a half, and if I hadn't he wouldn't have a temporary tooth left and now he has all his teeth except the lower bicuspid. I first filled the teeth with amalgam. The first thing I knew he had a dead tooth. The little fellow came in and sat down in the chair and let me drill the amalgam out. I had educated him so he would let me do what I wanted to with him. I took the amalgam out and opened the root canal and the trouble disappeared. He was then a little over four years, and you know it is hard to get a rubber-dam on a tooth for a child, and I was puzzled about getting the roots filled. I thought I could experiment with my boy if with no one else. You know the preserving qualities of glycerine? I filled those roots with glycerine. I saturated cotton and packed it in the root and then filled with gutta-percha, it does good service and has never given a particle of trouble.

DR. —: There has less attention been paid to this subject than formerly, and might we not upbraid ourselves a little for this and accuse ourselves with indolence that the success along this line has been so limited and we haven't felt it worth while to give attention to children's teeth. I believe a better day is coming and a better state of affairs in the future. Take the matter of children's peculiarities. There is a case I saw a week ago. It is one of a family of four girls. The teeth have been taken care of by the father. He extracted the teeth from time to time as he thought it was necessary. Added to a hereditary deformity produced by the jaw of one parent was the teeth of the other, both of which were at variance. One of these cases has a very marked peculiarity. The lower jaw comes over the other so it goes almost to the surface of the upper teeth. They are very unfortunate cases indeed.

AMERICAN DENTAL ASSOCIATION.

Reported for OHIO DENTAL JOURNAL by Mrs. J. M. Walker.

Concluded from page 106.

Section VI. further reported the

FINAL REPORT ON THE EXAMINATION OF HUMAN CRANIA,

By Dr. J. J. R. PATRICK, which at the request of the author was read by title, and also a review of Dr. E. S. TALBOT's work on the

ETIOLOGY OF DEFORMITIES OF THE HEAD AND FACE, JAWS AND TEETH.

Section VII. reported two papers, one on a

NEW OPERATION FOR THE EXSECTION OF THE TRIGEMINAL NERVE,

By Dr. T. W. BROPHY, for the relief of neuralgia, which has been successfully performed in three cases. In this operation the foramen is enlarged from above downward, enabling the operator to carry a slender curved drill along the line of the canal, the finger of the left hand recognizing the presence of the drill before it passes through the soft tissues, the contents of the nerve canal being removed more easily than that portion of the dental pulp which is in the root of the tooth. The operation is especially commendable in that there is no division of the external tissues and no hemorrhage.

In reply to a question, Dr. Brophy replied that the first of these three operations had been made in April, and there had been no recurrence of pain.

Dr. JOHN S. MARSHALL does not think that sufficient time has elapsed since the operation to pronounce that there will be no recurrence. There may be relief for a year even and then it may have to be done over again, and perhaps three or four times. As much as three inches of the maxillary nerve has been removed and yet there will be a reformation unless we reach its peripheral origin. The source of the trouble may be in the ganglion, in the brain, or from some spiculæ of bone pressing on the nerve.

Relief in these cases is only temporary and the same conditions will recur when the nerve tissue is built up. There is no cure. But this is an easier way than the old method, and it does

not disfigure the patient; but he would expect hemorrhage in some cases, necessitating ligating the inferior dental artery.

DR. PATTERSON asked what he would do in case that long slender instrument were to break.

DR. BROPHY: If the instrument is properly tempered it is not likely to happen, but if it did it would be necessary to remove the maxillary plate and remove both the instrument and the nerve, but he hoped it would never happen.

Dr. Brophy does not think there will ever be a recurrence; the inside of the canal being reamed out by the instrument, bone will be organized from the deposits of plastic matter and the canal be filled up. There will be no recurrence if the source of trouble is attainable. In one case he found the source of trouble to be that the nerve had three or four times its normal volume, and appeared as if it had been ligated at the foramen.

A paper by DR. WM. N. MORRISON (St. Louis), on

PLANTING TEETH,

was next read.

This paper reviewed briefly Dr. Morrison's practice in this line for the past eighteen years, during which time he had not had one unfavorable or dangerous symptom.

Most of the cases reported at the "Centennial," in Philadelphia, have "gone over to join the great majority," but a few are still acting well their part. In his earlier experience he deemed it essential that the tooth to be planted should be *fresh*—not more than twenty-four hours out of the mouth, but since Dr. Younger has demonstrated the value of dry specimens the operation has been greatly facilitated, though freshly extracted teeth are preferable. This subject has not yet been thoroughly investigated from the physiological and pathological standpoint. There seems to be an aversion to bringing it up for discussion. When asked why odontoclasts attack promptly the roots of some planted teeth while others have remained intact for from twelve to fifteen years, no rational or intelligent answer has been given. An unhealthy, neglected mouth, with the soft tissues in a tumified condition, encourages this retrograde metamorphosis. Physical culture results in the prevention of all classes of microscopic organisms that work destruction in the mouth. Dr. Morrison says: I have accidentally stumbled on the fact that massage

treatment with the ball of the finger and the bristles of the tooth-brush, over the whole plate of the alveolar process, exerting a friendly friction several times daily, with frequent rinsing, with warm water; this will preserve the root of the tooth for a long time, and the patient who thoroughly follows this method will rarely lose a planted tooth.

Dr. Morrison then gave the history of a number of cases of teeth planted from two to five and fifteen years. One remarkable case, of which the early history is on record in the "American" Transactions for 1875, is still in good condition, having done good service for nineteen years. It was apparently a desperate case in the beginning. The patient was a lady, then forty years of age, of delicate constitution and anemic habit; the condition of the gums was bad, and receded from this tooth so that a thin broach was easily passed beneath the gum. There was a large decay in the distal surface, had exposed the pulp, having an oxychloride filling, and another decay below this filling. The pulp in the posterior root was dead, but in the anterior root and the body of the tooth it was alive. The patient was anxious to save the tooth, but was not able to stand the necessary operation. The tooth was removed, the roots and crown cavity filled, out of the mouth, deposits of tartar removed and the tooth returned to place. For three or four days the patient experienced considerable pain, but in a few weeks it became comfortable and in five months it was the firmest tooth in the arch—which is unbroken. That was the report made in 1876. The tooth was seen recently (1894), and is still in good condition.

Another case reported was of a tooth which had been replanted by another dentist. A gutta-percha filling had expanded and cracked off the labial face of the crown. The palatine portion and the root being firm, a metal crown was adjusted, but this broke off from too strong occlusion. The implanted root was then removed and another tooth planted, April 26, 1890, which is a magnificent success. In another case a tooth was planted in 1879, which did good service for fourteen years, when a successor was planted in the socket, which is giving satisfaction.

Section VI. passed.

DR. A. W. HARLAN, Chairman Section V.,

MATERIA MEDICA AND THERAPEUTICS,

announced the report from this Section, which was made by the secretary, Dr. Geo. E. Hunt. The report was a brief resume of the value of Schrier's preparation of "Kalium Natrium;" of Dr. Callahan's method of opening root canals by the use of sulphuric acid; of the value of pyrozone in the treatment of pyorrhea alveolaris; of milk of magnesia in erosion.

DR. A. W. HARLAN stated that after twelve year's service as Chairman of Section V, he voluntarily retired in favor of Dr. J. S. Cassidy, Covington, Ky. Dr. Harlan reviewed the advances made since 1880 in this branch of dental science. Prior to that date it was included in the curriculum of but one dental college, now it is compulsory in all. He attributes this largely to the work of Section V, of the American Association. Previous to that date, dental treatment was almost entirely mechanical, the few drugs in use being used empirically. Now the internal administration of drugs and the use of antiseptics is an important and essential feature in the treatment of diseases of the antrum, of the dental pulp, and of the oral mucous membrane. All this is evidence of the attainment of advanced knowledge. Among the valuable new remedies mentioned by Dr. Harlan is *alumnol*, an astringent of great value. In the treatment of pyorrhea pockets, four to seven grains of alumnol, dissolved in water, to which one drop of oil of Ceylon cinnamon is added, injected daily around the roots of the affected teeth for two or three weeks, will cause the pockets to fill up with new growths. This may be preceded by a dilute solution of trichloroacetic acid daily for a week, followed persistently by the alumnol injections. In oral catarrhal conditions, nitrate of silver is valuable as a styptic, astringent and stimulant, the objection being the blackening of the tissues. In deep pockets it forms a coagulum before reaching the deepest parts.

The local treatment of pyorrhea must be based on the theory of micro-organisms, and if the origin is not clearly local, constitutional treatment must be added. The use of pure drinking water in large quantities has a beneficial effect on all mucous surfaces. Gum-massage daily, using 40 grains borax to 1 ounce lanolin, to which an essential oil may be added for piquant taste, and a little tannic acid in case the gums bleed, will be found of great assistance.

DR. CASSIDY called attention to a remedy recently introduced, known as "Formalin." It is not a secret nostrum, though given this proprietary name.

Used in root canals it embalms permanently any contents that cannot be removed. Muscular tissue is perfectly cooked by one immersion, forming a homogeneous mass similar to horn. If the yolk of an egg is treated by formalin, no sulphuretted hydrogen is apparent. It is readily absorbed by water, from which the escaping gas is absorbed by solids, as cakes of pumice, etc., and placed in drawers, it will be valuable in sterilizing instruments, etc., keeping them permanently sterilized. Formalin has been in use too short a time to pronounce positively upon its use in the mouth, but from its known action elsewhere it promises much.

ADDENDA FOR PATHOLOGY.

DR. S. H. GUILFORD: An interesting case in pathology was overlooked when Section VII had the floor. The case was reported to the Odontological Society of Philadelphia by Dr. Gaskell.

DR. GASKELL: The case is rather unique. The patient presented some two and a half years since, showing a peculiar pinkish spot on the central incisor, showing the same on the labial and palatine walls. The tooth was perfectly sound externally: there had been no irritation and no soreness. As no cause for the appearance was discernable, I advised waiting, thinking it might disappear spontaneously, as it had appeared. But in about six weeks' time the palatal wall crushed in, and the crown was found to have been but a mere shell, the enamel wall of the labial surface being so thin that an instrument could be seen through it. This spring the patient presented with a recurrence of the same thing in the other central incisor. This was shown to Dr. E. C. Kirk. He suggested systemic treatment with iodide of arsenic. I opened into the tooth and found the pulp in normal condition, with perhaps a slight deposit of lime salts, but scarcely perceptible. The pulp was perceptible through the palatine and labial walls, having the appearance of a pink gutta-percha filling inside of very thin enamel walls. After a time there seemed to be a filling up again with a marked decrease in the pink spot. The patient was a college boy about twenty years of age, and in good

health. A sample of his blood was examined microscopically and found to be perfectly normal. I would like to have some light thrown on this particular phase.

DR. JACK: My son has had a similar case, and forty years ago I saw a case of the same character. The dentinal substance seems to have been resorbed. The spot in this case was closest to the outer wall of the tooth at the mesial or inner aspect, extending above the margin of the gum. In the more recent case, in my son's practice, he did not consult me, but at once drilled into the tooth, destroyed the pulp, and filled the root with gutta-percha and oxide of zinc. The tooth was perfectly sound and had had no previous treatment. I saw both of the cases described by Dr. Gaskell. The pink spot was very apparent, and as I remember, like the one I saw forty years ago.

DR. FRANK ABBOTT: This makes five cases of this very peculiar absorption of the inner portion of the tooth, and all reported from Philadelphia. Apparently none have been heard of, from any other place. I have never seen such a case, never heard of anything resembling it. There are but two solutions of the question. Either there must have been some minute external opening into the tooth, through which acids penetrated, creating an irritation of the pulp, causing absorption of the dentine—though how this could possibly have gone on to the extent described is a mystery; and how the lime salts were taken away is another mystery. I do not see how it could be brought about. The dentine must have been destroyed in a manner similar to the removal of the roots of the temporary teeth when they are absorbed—a dissolving out of the tooth substance. It would seem as though there must have been some irritant in the circulatory apparatus, though if that were the case I do not see why the bones all over the body were not affected and the patient left limp like rubber. That a substance that is harder than any other portion of the body would be dissolved out from the inside of the tooth till the walls were left so thin that they could be seen through, without the presence of any acid to dissolve out the lime salts, with no apparent source of irritation to cause it, is a mystery which is hard to solve, figure it out as best you can.

DR. JOHN S. MARSHALL: It can only be explained on the hypothesis of a retrograde metamorphosis of tissue, as the roots of living teeth are sometimes destroyed, the action of osteoclasts

in the dental pulp, removing the tissues. The one is as difficult to understand as the other.

DR. ABBOTT: By a reversal of the process by which the tooth is built up the lime salts are dislodged and thrown down, dissolved, taken up in the circulation and carried off. I cannot conceive of such a special organ as that called osteoclast—a supposed body, whose peculiar function it is to dissolve lime salts and destroy bone tissue. There are no such things as osteoclasts, but there must have been some irritant. I never heard of these cases except in Philadelphia, but there are many peculiar diseases there never heard of anywhere else.

DR. MARSHALL: I stick to the osteoclasts as offering the only explanation. There may have been some preceding shock, perhaps excessive heat or cold to start the irritation, and the subsequent formation of osteoclasts furnishes a satisfactory explanation.

DR. ABBOTT: Will Dr. Marshall please explain what an osteoclast is, and where it comes from?

DR. MARSHALL: I don't know what an osteoclast is, or where it comes from, but I do know we find what we call osteoclasts.

DR. GASKELL: I would like to ask what becomes of the osteoclasts in the case in which the treatment was successful?

DR. MARSHALL: Osteoclasts are not supposed to work on forever. After they had scooped out the inside of the tooth cementoblasts took up their work and began to fill up that space.

DR. B. HOLLY SMITH: This reminds me of an anecdote told by Henry W. Grady: Some boys in a spirit of mischief, pasted together some of the leaves of the Bible in a country church, and when the old preacher read the chapter, he read: "And Noah took unto himself a wife, and she was forty cubits long, and forty cubits broad, well tarred inside and out with pitch." The old man closed the Bible and reverently said: "My brethren, I never observed that passage before, but I believe everything that is inside the cover of this Holy Book. Verily, man is fearfully and wonderfully made!" And so it is with those Philadelphia incisors.

DR. PALMER: I seldom present anything that I have not demonstrated, but I will offer a suggestion. In discussing a question of this character, we should first consult nature's process in the construction of the living body, and the results of a possible

reversal of this process. Circulation being cut off, the current is turned back. No outside exposure is necessary to produce decay below a filling. From irritation of some character, the lime salts are dissolved and carried off, or, on the other hand, lime salts may be deposited and the pulp cavity be filled up. If acids are present it will not fill up, but with a non-irritant, non-conductive substance as gutta-percha, nature may produce currents which will fill up the space. Nature can build up or pull down, according to conditions. As nature deposited the lime salts, nature can re-absorb them, though we cannot say how. We cannot account for this reversal of nature's process.

DR. JACK: It is remarkable that these five cases (I know positively of four) should all have occurred in Philadelphia. The pink appearance was of a higher grade of color than the normal pulp, and the destruction of tissue was very great. In the two cases of Dr. Gaskell's, there was perfect symmetry of the lateral and lingual surfaces of each tooth.

DR. B. H. SMITH: What was the character of the internal surface of the cavity?

DR. JACK: It was regular and even, with no bay-like excavation, but regular, as if made with a round burring instrument.

DR. CRAWFORD: I doubt if this could be called a hypertrophied pulp. I should call it pulp transformation. The pulp, instead of continuing its work as a tooth builder, became a tooth re-absorber or remover.

Dr. Crawford described a case in which the roots of a right superior sixth year molar were quite devoid of bony tissue, the living pulp having acted as a tooth destroyer.

DR. GASKELL had enquired carefully into the precedent history of the cases he described and there had been no irritation, not the slightest soreness. When he removed the pulp the root canal did not show any marked increase in size, though the apical foramen was slightly larger than normal. The pulp was very vascular. It was all removed at once with the aid of cocaine; styptics had been necessary to remove hemorrhage.

DR. OTTOFY: Those who invented the theoretical osteoclasts, to account for the peculiar conditions leading to the absorption of the deciduous roots, have never seen one. The theory is defunct, and there was never any necessity for it. The blood stream is a sewer as well as a purveyor. Much useless matter is removed

through the blood stream, and there is no reason why dissolved dentine should not be removed in that way. Particle by particle the carbonate and phosphate of lime is brought to the root, and it can be carried away also, in solution, very finely divided, carried off through the blood channel.

DR. T. T. MOORE: I have had a case of this kind, a gentleman 45 or 50 years of age, though it is rare in the human species. There was no decay; the tooth had never had a filling—I had examined the teeth a number of times, but could find nothing wrong. He said he felt inclined to grind and crush his teeth together, and it worried him. I examined most thoroughly, even with the electric light, but could find no external cavity, though I separated the teeth, as he located the trouble between the first and second bicuspid. When he came again one of those teeth had crushed in, and it cut like old cheese. I wrote to the late Dr. Wm. H. Atkinson about it. He said it was a case of liquefaction of the dentine; that it had been decalcified and taken off by the pulp. The same thing recurred in five of his teeth. Nature is busy all the time. She builds up energetically; but when her work is complete she does not remain idle but begins to tear down again. I could find neither systemic nor local cause in this case. It is a singular fact however that the patient could never pare his nails, but had to use a file. There may have been some systemic trouble shown in this relation between the teeth and the nails.

DR. ABBOTT: Dr. Gaskell opened the book a little for us when he said that he found the foramen enlarged, and that it was difficult to stop the hemorrhage. It is fair to presume that through this enlarged foramen there was a larger flow of blood than normal, and the pulp being over-nourished became an irritant liquefying the dentine, the lime salts being taken up and carried away. That one statement opens the way to a reasonable explanation.

DR. PATTERSON has had several cases where, though the finest probe failed to reveal any external opening or source of irritation, yet after extraction, closer examination showed such imperfect tooth structure as to prove that the irritation of the pulp came from the outside as surely as though there had been caries. In fact in one case he found quite a large internal cavity, with no opening to the outside that could be detected by the finest instru-

ment. Under a strong glass, however, he found such imperfections in the enamel as to prove that the pulp irritation was directly from outside sources.

DR. MCKELLOPS: I would be glad if any one can tell me how to diagnose an ossified pulp. It is often the cause of intense suffering, when the teeth are, to all appearances, perfect. Extraction offers the only remedy, and then we find an ossified pulp. I will ask some one to tell us how to diagnose this source of suffering.

A patient ten years old recently came to me with a small abrasion of the enamel, near the gingival margin. Another dentist had applied arsenic and the tooth had turned perfectly red. I took it out and found the pulp ossified.

DR. CROUSE: I second the question of Dr. McKellops. Will some one tell us how to diagnose ossified pulps so that we may know when that is the cause of pain. I have a case where I could find no cause for severe suffering, which gives a nervous reflex action all over the mouth, but by tapping on the teeth, I found one tooth a little more sensitive than the others. On that indication, I have removed three teeth in one month, and found ossified pulps, and I now suspect another.

DR. GASKELL: It is better to drill into the tooth and find out. Extracting the tooth is like cutting off a man's head to save his life.

DR. BROPHY: With the aid of an electric incandescent light, in a darkened room, you can nearly always determine whether the pulp is calcified or not. An unusual degree of opacity is seen in a tooth so affected.

DR. JNO. S. MARSHALL: This is one of the most difficult things to diagnose. We can only conclude, if there is no other possible cause this must be it. Unless we resort to the drill as suggested, but we do not always know which tooth to drill into. The only way is by the process of exclusion. If we cannot find any other system it must be ossification. In young persons, if there is a spicula, the pain will be increased by anything which increases blood pressure, as by rapid walking, bending over, causing the blood to run to the head, anything causing extra pressure on the arterial system—causing expansion of the pulp. This may help you some times.

DR. ABBOTT: What causes ossification of the pulp? Why

does it occur? What is the origin of the trouble? Let us all think this subject over during the coming year, and talk it over again at our next meeting.

DR. McKELLOPS protested against passing the subject of Operative Dentistry simply because the section offers no report. He said: "I would like to ask what we, as a profession make a living from?" By operative dentistry, at least ninety per cent. of it, and yet we have no report and no discussion of the subject in which we are practically most interested—that by which we support our families. Give these young men the benefit of your experience on this, the most practical part of dentistry—that by which they must make their living.

The subject was passed, the time set apart for elections having arrived. Asbury Park was selected as the next place of meeting, on the first ballot.

OFFICERS ELECTED :

J. Y. Crawford, Nashville, Tennessee, President.

S. G. C. Watkins, Mont Clair, N. J., First Vice President.

Thos. Fillebrown, Boston, Second Vice-President.

Geo. H. Cushing, Chicago, Recording Secretary.

Emma Eames Chase, St. Louis, Corresponding Secretary.

Henry W. Morgan, Nashville, Tenn., Treasurer.

C. N. Peirce, H. A. Smith, T. S. Waters, L. Ottofy, Executive Committee.

DENTAL PROTECTIVE ASSOCIATION :

At the request of Dr. J. N. Crouse, a committee of three from the American Dental Association and two from the Southern Dental Association, were appointed to examine the books and papers of the Dental Protective Association.

The committee consisted of Drs. H. A. Smith, Louis Jack, C. E. Esterly and Drs. R. R. Freeman and V. E. Turner, reported at a subsequent session that they had examined all of the books and documents submitted by Dr. Crouse, and found the funds fully accounted for, and the affairs of the Association administered with discrimination and economy.

UNIFICATION OF DENTAL LAWS.

Drs. B. Holly Smith, A. W. Harlan and J. Y. Crawford were appointed a committee to confer with similar committees from

other dental societies, in an effort to secure unification of the dental laws of the different states, and especially in regard to registration and license to practice dentistry.

ALL SORTS.

Listerine is a good vehicle for keeping small instruments bright and aseptic.

Patching Amalgam Fillings.—Amalgamate the surface of the old filling, and lay on it a thickness of gold foil. Will make a perfect joint.
Items of Interest.

Pulp Capping.—Dr. L. Henley, of Marshall, Texas, treats healthy exposed nerves by covering them with loosely folded tin foil, dipped in campho-phenique.—*Items of Interest.*

To Quiet Nervous, Apprehensive Patients.—Oil of wintergreen—one to eight of alcohol—inhaled from a napkin, will often quiet nervous patients, so that you can work for them when without it they would not even tolerate a mouth-mirror.—T. M. ALLEN, *Items.*

For Very Soft Teeth.—To harden the dentine under a cement filling, rub on a little tannin made into a thin paste with oil of cloves. Fill with oxyphosphate. The softened dentine soon becomes “tanned” and a permanent covering made for the pulp.—T. B. WELCH in *Items.*

Fitting a Logan Crown.—In the *British Journal*, Dr. Frank Harrison suggests smoking the dowel, to the crown, with a burning match or taper, then when inserted into the canal it can be readily seen just where it impinges, for at that place the smoked surface will show the point of contact to be relieved.

A Convenient Rubber Heater is made by taking a piece of asbestos an eighth of an inch thick and eight inches square, put a tin rim on it to strengthen it, dip it in water, wipe the surface, lay the rubber, ready cut, upon it, and place over the vulcanizing lamp for a minute or two before packing.—*Dominion Dental Journal.*

Platinum Discovery.—In view of the fact that the electrical appliances are putting such a strain on the lessening supply of platinum from the Ural mountains, says the *Popular Science News*, it is gratifying to learn that the home production is increasing. The Copper Cliff nickel ore

contains 0.2 per cent., some found at Denison, Ont. has given 0.53 per cent., and a recent find in British Columbia promises still richer returns.

Neuralgic Remedy.—In the *Dominion Dental Journal* for January, Dr. G. V. N. Relyea, speaks of his preparation thus :

“My excellent neuralgia remedy, of which I sold in Canada and in this city pounds and pounds, for facial neuralgia has no equal :

Oil of peppermint	-	-	-	-	1 lb.
Aconite	-	-	-	-	$\frac{1}{2}$ lb.
Chloroform	-	-	-	-	$\frac{1}{2}$ lb.
Alcohol	-	-	-	-	$\frac{1}{2}$ lb.

Apply with a camel's-hair pencil.”

To Clean Nickel Plated Articles.—Articles of nickel or nickel-plate, may be cleaned by laying them for a few seconds in a mixture of one part sulfuric acid and fifty parts alcohol, washing with water, rinsing with alcohol, and rubbing dry with a linen rag. This process cleans perfectly and should be especially useful on plated articles, on which the usual cleaning materials act destructively, cutting through the plating and causing it to flake off. The yellowist and brownest nickled articles are restored to pristine brightness by leaving them in the acid solution for a quarter of a minute. Five seconds are usually sufficient.—*Literary Digest*.

To Test for Paraffin in White Wax.—There is one test for paraffin which we have found most useful, says the *Chemist and Druggist*, and it is as follows :

“Heat in a small porcelain basin about 2 drs. of concentrated sulphuric acid (but not boiling it), and on the surface drop about 30 grs. of the sample in shavings. Beeswax is immediately charred, and if there is paraffin present it gathers towards the edge of the dish, and on cooling solidifies to a violet-tinged mass, which can be extracted with chloroform. If the acid is boiled the paraffin is also charred, but this, on a little experiment, can be easily avoided.”

Advantages of Attending Dental Societies.—In his Presidential address Dr. J. A. Fothergill says :

“A man who does not associate with his fellows is apt to become rusty, to lose interest in the scientific aspects of his work, and merely look on dentistry as a means of making money. Or, if his enthusiasm is too great for this to happen, and his abilities are above the average, there is the danger of isolation breeding conceit. On the contrary, there is no such stimulus as meeting with our professional brethren. We get new

ideas, and are made to think about what we are doing, and a healthy spirit of emulation is fostered, which makes a man strive to do his work in the best manner of which he is capable."—*Extract Dental Record.*

Welding by Simple Pressure.—Some time ago a Belgian chemist named Spring demonstrated that two or more metals could be forced to form an alloy by simple pressure when great and long continued, at a temperature below their fusing points, and that chemical combination could be induced by similar methods. His recent experiments show that cylinders of gold, lead, etc., with plane ends, were pressed together end-wise in a screw clamp and kept for several hours in a heating-oven at a temperature of 2000° and over, when they were found to be so firmly joined as to practically form one piece of metal, breaking in a separate place when forcibly separated. Platinum cylinders were thus welded at a temperature 1000° below the melting point.

An Incident that May Happen from the Subcutaneous Injection of Ether.—The *Deutsche Medicinal-Zeitung* for September summarizes from a Russian Journal an account, by Dr. M. P. Michajlow, of a case of acute cardiac weakness in which a hypodermic injection of ether, administered to a patient with typhus, gave rise to the formation of a large swelling filled with gas at the site of the injection. This is attributed to the vaporization of the ether after its injection, and it is said that it may happen even in persons whose temperature is normal, but that then the formation of the bleb is so gradual that it escapes notice. In the instance related the patient and the other occupants of the ward were not a little alarmed at this sudden appearance of the swelling.

Aseptic Hypodermic Solutions.—At a recent meeting of the *Société de Thérapeutique* a communication was made by Drs. Berlioz and Duflocq, in which they described the methods adopted by them for administering medicines subcutaneously without risk of septic poisoning. The solutions are prepared under conditions of absolute asepsis and preserved in tubes of yellow glass, containing from two to four centimeters each. The neck of each tube is drawn out to a tapering point and, after filling, sterilization is effected before closing in an autoclave or a vacuum apparatus according to the volatility of the liquid. When required for use the neck of the tube is broken off and the needle point of the previously sterilized syringe is immediately introduced into the opening thus made. Full working details, with illustrations of the apparatus employed, are given by the authors.

Combining Tin and Gold.—At the N. Y. Odontological Society Dr. Lord gave his method of combining these materials as follows:

"I may say that in my experience in using gold and tin together I get better results from having the gold very largely in excess, and folding the two foils together; then, if I want at any time to make a filling so as to neutralize the color of the gold, I put about one-twentieth of tin with the gold, and it makes a very pretty color, and one that will not tarnish. It is very nice for the labial surface.

"I may also say that Mr. Williams has recently brought out some tin-foil that is very much superior to any that I have ever used. It works waxy, I might say; we can do anything with it, with suitable instruments. A very little of it put with soft gold makes the gold tougher. It requires much less anchorage, and you can build out or contour with it as much as you desire, if the cavity has three walls remaining."—*Extract International Journal.*

The Mechanism of Death under the Influence of Cocaine.—

Dr. Maurel, of Toulouse, has recently been carrying out a series of experiments with reference to the toxic properties of cocaine. He finds that the leucocytes become rigid and spherical, increase in size, and lose their adhesion to the walls of the vessels. The capillary vessels contract, a circumstance which may give rise to thrombosis and embolism, especially to pulmonary emboli. These changes in the leucocytes take place also with small doses of cocaine when the latter is present in considerable proportions, 10 per cent., for instance, a fact which explains the serious ill-effects sometimes following the employment of a small dose of cocaine in concentrated solutions. Pulmonary embolism being the most serious ill-effect of cocaine intoxication, it seems plausible that intra-arterial injections in the direction of an unimportant viscus would be much less dangerous than intravenous injections. The author's experiments show that this theory is well founded, seeing that he was enabled to inject into the femoral artery of a rabbit 10 centigrammes of cocaine for each kilogramme of the animal's weight without killing it. The toxic action of cocaine is not restricted to its effect on the leucocytes, but exerts its influence also in other directions, the most notable of these effects being contraction of the smaller vessels.—*Journal Brit. Dental Association.*

A Mouth-Wash in Pyorrhea Alveolaris.—

In the *Dental Review* Dr. G. V. I. Brown says: "In regard to treatment of the pockets where the denuding process has gone to a considerable degree, I generally find it advisable to take a bur and smooth the irregular carious edges of the surrounding alveolus. I do not think we can reasonably expect to find the discharge stop as long as those rough places are left full of bacterial hiding places.

With regard to cleansing the mouth, the first thing I do is to fill the

mouth with some antiseptic. Lately I have used peroxide of hydrogen $\frac{1}{1000}$ bichloride of mercury, about equal parts, syringing the mouth and letting patients hold it there several minutes, repeating the process for some little time. First sterilize the secretions of the mouth, then the pockets afterward. I have prescribed and found useful, glycerine and listerine of each 33, and carbolic acid 33; take half a teaspoonful in a third of a glass of water. I instruct them to keep that in the mouth not less than three minutes and as much longer as they wish until the mouth is cleaned. I find that of great assistance."

Porcelain Inlays.—Regarding this kind of work Dr. A. E. Matteson, in the *Dental Review* says:

"I have been working on porcelain inlays for a number of years. I have worked porcelain, I have worked glass inlays, and I think I have something like six or eight different kinds of bodies for making inlays, in my office. I am not satisfied with the results. I think I can take more time to make an inlay than is required to make a continuous set of teeth, and when I get through it is not satisfactory. It is all very nice to talk about, but when you come to match porcelain—I mean to bake it to the color required—you cannot do it.

"One of the gentlemen preceding me spoke of the desirability of using a glass body. The glass body is too perfectly worthless for inlays. The only body which I consider is at present fit for that purpose is the English body—Esham's. That can be obtained white; as white as the whitest china, and it can be stained with pigments in shading the teeth, but when you have it shaded and baked you may make a botch of it when you come to bake another piece of that same substance, and when you insert it in the teeth with cement or the material which retains it in its place, the color is off. It is possible that a person might go to work and make it first, and guess at the color, but it requires a great many times of baking to get even an approximate."

Dental Hints.—The following are clipped from the department conducted by Dr. C. E. Klotz, in the *Dominion Dental Journal*.

"After the cuspidor is washed and wiped dry, rub it with an oily rag. This will permit the blood and saliva to run off easily without leaving any trace on the funnel top.

"**PAIN AFTER EXTRACTION.**—Dr. Wilson recommends as a never-failing remedy the inhaling through the nose of a strong solution of ammonia.

"**A NEW USE FOR GUTTA-PERCHA.**—Gutta-percha can be softened almost to a liquid in boiling water to which a little glycerine has been

added. In this softened state it will not only absorb tannin and chloride of iron, but also benzine, carbolic acid, salts of mercury, and other hæmostatic and antiseptic remedies. It will retain its efficiency indefinitely. After the gutta-percha is saturated with the drug, allow it to cool and form into pellets or roll into sheets. To use it, soften in warm water.

“**LOWER DENTURES.**—Dr. Walter Coffin takes a platinum wire, half-round or oval, bends it to the shape of the arch, and winds in open spirals fine gold wire around it and solders it together, leaving the end of the fine wire free, or solders small pieces at intervals to the bows. These ends are bedded in the plaster of Paris in flasking, and keep the bow in place. After vulcanizing, he has a strong and somewhat weighted plate.”

An Improved Method of Disinfection of Putrescent Pulp-Canals.—In an article presented before N. Y. Odontological Society and published in the February issue of the *International Dental Journal*, Dr. Barker says:

“I am requested to show you an improved method of disinfection of putrescent pulp-canals. The materials which have been introduced for that purpose within the last few years contain a surplus of oxygen, which, when brought in contact with any material which has a strong affinity for oxygen, as pus, for instance, causes the pus products immediately to change their nature. These materials, however, have some disadvantages. They are almost all extremely caustic. That objection applies to the strong sulphuric acid which is now much used. The materials which I prefer for that purpose are two very simple ones, and by their union in the pulp-canal they set free the nascent oxygen. They are permanganate of potash and peroxide of hydrogen. When brought in contact in the canal the effervescence is very violent. I will illustrate it in your presence. The best way to do it is to take a Donaldson bristle and dip it in the powdered permanganate of potash, and then with a little syringe drop a little peroxide of hydrogen on it. [Dr. Barker illustrated the effect of the two materials on his hand.] It produces on the hand only a slight warmth. If the two are made in a solution the union is much more violent, amounting almost to an explosion, and the effect is much more noticeable. It does not stain the teeth. I have stained my hand because I did not use a sufficient quantity of the hydrogen to neutralize the potash. I have been using it for some little time. The teeth so treated show a remarkably quick cure. I have used this method, and after two or three applications the tooth fails to show the characteristic foaming when peroxide alone is introduced. I have attempted to

close up and fill them in a week or ten days, just to see how quickly it could be done, and with very good success."

A Case in Practice.—Some time ago I was called to the house of a lady who had been suffering from toothache for some time. When I arrived the lady told me that Dr. ——— had treated her for a length of time but could not relieve her of her pain, and finally told her that she was not susceptible to medicine, and that she would have to consult a specialist. Upon examination I found that the lady had a copper amalgam filling in the first upper molar, and first and second bicuspid badly decayed. I extracted the molar at once and found the roots abscessed, with a large sac on one of them. I expected that this would relieve her of her pain, but the following day she came to my office and complained of having the same pain. I now treated the bicuspid and dismissed her to come again at a certain time. The second day following she came with the same complaint. I removed the dressing from the bicuspid and devitalized the pulps, extracted them, and prepared the canals with an antiseptic dressing, intending to fill them the following day. (This was not done in one sitting; it took several.) When she came she complained that the pain was worse than ever. Now I was in a dilemma, and did not know what to do. I again examined her teeth very carefully and found every one apparently sound. I happened to remember a case I had many years ago, where all the teeth in a patient's mouth were sound, but that one molar had a peculiar sound different from the rest when tapping it. I extracted this molar and found, after splitting it, that the nerve was dead and the odor from it was anything but pleasant. I now determined to drill into the second molar, and as I reached the pulp chamber a quantity of pus was discharged and the pain was immediately gone. I treated the canals and in due course of time filled them as well as the canals in both bicuspid, and—quietness reigns supreme. This case shows that in apparently sound and healthy teeth diseased pulps may be present.—*Monatsschrift Deutscher Zahnkünstler.*

Politics in Dental Associations.—In an article in the February issue of the *International Dental Journal*, Dr. James Truman points out the evils of this undesirable state of affairs and regarding a remedy he says:

"There is only one way, it seems to the writer, to meet this deep-seated poison in the professional body, and that is to make an entire change in the organic laws. One society, recently organized, has taken the election of officers almost entirely out of the hands of the main body. The members have the privilege of nominating a certain number for each office, and from these the council must select one. It is hoped by this

method, similar, we believe, to that in force in the National Medical Association, that the disturbing element of politics will be entirely eradicated. There are some objections to this mode of doing business, as its tendency is to a centralization of power and a partial deprivation of the individual right of expression, so dear to the average American; but some sacrifices must be made for the good of the whole, and this plan has less of evil in it than that ordinarily adopted.

If we can rid our organizations of this political tendency, we may attempt other reforms; but while men who are working solely for the advancement of the profession, and care nothing for so-called posts of honor, are constantly to be confronted with political warfare, they will lose interest and decline to take an active part. It is for this reason, it is surmised, that some of the best men in dentistry rarely or never are seen at the annual gatherings, preferring to do their work in their own local organizations. A total change must be made in this direction, or the result will be that new organizations will spring up in which only those can enter who are willing to lay aside all selfish aspirations and work solely for the true advancement of the associations in scientific knowledge, and not for the ephemeral glorification of the individual."

Popular Dental Education and the Newspaper.—In a contribution in the *Dental Cosmos* on this subject Dr. J. C. Walton says:

"We are admonished by our code that 'it is our duty to enlighten and warn the public' (see Article IV). A liberal interpretation will permit the means here advocated. The newspaper is at once the most acceptable to the masses, and the surest, quickest, and most economical way for us to reach the public. Let our state societies lead by creating an editorship and adding from two to five counsellors, who shall be in sympathy with the object, understand their duties and the needs of the people. To the editor let any one send two copies of any article he wishes to publish, one to be filed and the other to be sent back approved, or corrected and approved. Their duties will be to watch over all publications, assist in supplying matter, secure the public against falsification and error, encourage and stimulate the profession to educational effort, and see to it that nothing is sown broadcast unless inspired with full information and prepared after deliberate reflection.

Such a plan is liberal, just, ethical, and philanthropic. It may be made effective and profitable. Add to this the quick investigation and report of new nostrums, processes, methods, machinery, etc., upon market appearance, and we shall soon reach the professional position we deserve. If this present educational inertia is not followed by emphatic changes, the professional disgrace, the internal discord, and the public danger of the past will be the condition of the future."

Combination Gold and Porcelain Work.—In the January *Dental Review*, Dr. Gallie calls attention to the system advocated by Dr. Taggart. He says:

“Dr. Taggart uses the Diatoric tooth; he swages and burnishes a backing of pure gold to this tooth which furnishes a V-shaped receptacle for the porcelain; through this backing directly over large vertical hole in the tooth he punches a hole with a blunt instrument. By doing this a ragged margin of metal is forced part way down into the hole in the porcelain; into this hole he packs a mat of foil gold. After a drop of wax is placed on the porcelain is removed; the backing and gold that has been packed into hole coming away together. This invested and soldered into one mass. He then has a V-shaped receptacle and strong pin which fits over and into the porcelain, and when ready for adjustment, are cemented together. The great advantage of this system is that no tipping of occluding surface of teeth is necessary, and the porcelain is not subjected to any heat whatever, therefore, doing away with the constant fear we have that the porcelain may be changed in color and weakened by checks as we very often find them subjected to heat as in the ordinary way.

“Another excellent feature about this system is that if the porcelain becomes fractured by any means, it is so much easier to remove the single broken facings from its surroundings, than it is to remove the whole case, which is necessary in most cases when the ordinary facings are used.

“In reference to heating of porcelain, I will say that Dr. Taggart and many of the best operators in crown work never heat their facings. Instead of soldering the whole bulk of solder to the pins of facings, they rivet pins through the soldered backing.”

The Real Value of the Medicinal Peroxid of Hydrogen Preparations Found in the Market.—In an article on this subject appearing in the December issue of the *Times and Register*, H. Endemann, Ph. D., chemist, states that a standard solution as medicinal H_2O_2 must answer the following tests:

1. It should contain at least 15 volumes of available oxygen.
2. The quantity of free solids contained in 100 cubic centimetres should require not less than 1 c. c. and not more than 3 c. c. of normal volumetric soda solution, to be made neutral. Such a small quantity of free acid is not objectionable.
3. It should not contain any soluble baryta salts.
4. It must be free from sediment.

The different brands which he found on the market being submitted to the above tests, gave the following results:

BRANDS OF
H₂O₂ SOLUTIONS.

				Volume of Available Oxygen determined by means of a solution containing 5.665 Grammes of Permanganate of Potash per liter of distilled water.	Residue obtained from 100 C. C. of Peroxide of Hydrogen dried at 120 degrees C.	Acidity expressed in Cubic centimeters of Normal Volumetric Soda Solution for 100 C. C. of Peroxide.	Baryta found in Soluble Baryta Salts contained in 100 C. C. of Peroxide.
No. 1.	John Bene's	H ₂ O ₂ (Medicinal)		10.50	0.1886	2.19	None
No. 2.	Hydrozone			27.35	0.2180	3.11	"
No. 3.	Larkin & Scheffer's	H ₂ O ₂ (Medicinal)		9.65	0.1206	6.75	"
No. 4.	Mallinckrodt's	"	"	9.55	0.1408	1.43	"
No. 5.	Marchand's	"	"	16.55	0.564	1.29	"
No. 6.	McKesson & Robbins'	"	"	10.95	0.0540	0.44	"
No. 7.	Merck & Co.'s	"	"	0.50	0.2418	4.57	"
No. 8.	Oakland Chemical Co.'s	"	"	10.50	0.0382	0.34	0.0017
No. 9.	Peuchot's	"	"	10.60	0.4674	1.77	0.0018
No. 10.	Powers & Weightman's	"	"	8.40	0.0830	2.03	None
No. 11.	Pyrozone, 3 per cent.	"	"	11.20	0.0534	0.76	"
No. 12.	Rosengarten & Son's	"	"	3.10	0.1002	0.25	"
No. 13.	Smith, Kline & French Co.'s	"	"	6.15	0.0630	2.6	"
No. 14.	E. R. Squibb's	"	"	12.40	1.004	12.04	"

By referring to this table, it is easily noticed that brands No. 7 and No. 12 are valueless.

The brands No. 8 and No. 9 are not fit for medicinal uses, owing to the fact that they contain traces of soluble baryta salts.

The brand No. 3 has a heavy sediment of sulphate of baryta, which may be considered inert towards the system, but it is certainly detrimental to the keeping qualities of this preparation.

Brand No. 14, which is sold as a ten volume solution, is really twelve volumes, but is really too acid.

Brand No. 5, which is sold as a fifteen volume solution, is really 16.55 volumes, viz.: About 10 per cent. above the standard.

The brand No. 2, which is sold without any mention of volume, is really a 27.35 volume solution, viz.: Ninety per cent. above the standard.

None of the other brands come up to the standard, but on the contrary they run from 35 to 55 per cent. below.

An Interesting Case in Practice.—This case was presented before the N. Y. Odontological Society, by Dr. Wm. Jarvie, and published in Feb'y issue of the *International Dental Journal*.

"About two years ago a lady called on me, complaining of severe pain in the right superior lateral. The tooth had never been filled, and

was then free from decay, yet pain in it was frequent, and it was particularly sensitive to thermal changes. After treatment for some days and the pain not subsiding, I drilled into the palatine surface and applied creosote and arsenic to kill the pulp. After the removal of the pulp, and upon pumping carbolic acid into the canal, I noticed carbolic acid oozing out between the gum and the root upon the palatine surface. Close examination revealed absorption upon that side of the root reaching inward to the pulp. Further examination revealed a corresponding cavity of absorption upon the labial side of the root reaching into the pulp canal. The points of absorption were about one-quarter the length of the root beyond the gum margin. The tooth was treated and filled.

“During the past summer the tooth was broken off, the fracture occurring at the point where absorption had taken place and where the strength of the tooth had naturally become much impaired. I was away at the time, and as the broken part was still attached slightly to the gum, Dr. Turner, my associate, tied it in place to the adjoining teeth with waxed silk until my return.

“This seemed a case for transplantation, as for many reasons it was undesirable for the lady to wear a plate. After failure to secure a suitable natural tooth, I got a lateral with a badly decayed crown, but with a good and suitably-shaped root. To this root I attached a porcelain crown that matched the natural one perfectly, but I was perplexed for a time to know how to remove the portion of the root remaining in the jaw, which was firmly held in the socket. Any ordinary means would bruise the gum and possibly fracture the socket, and induce a condition of affairs fatal to a successful transplantation. I finally drilled through the centre of the root, almost to the end, following the canal, with a Gates-Glidden drill; cut a thread in this, and then inserted a screw firmly, pulling out the root by this means without injury to gum or process. I then inserted into the socket the root with artificial crown attached. This operation was performed ten days ago, with what ultimate success time alone can tell.”

Care of the Mouth and Teeth.—In the consideration of this subject, both in writing and discussion the chief attention is usually given to the teeth and the immediate tissues, and that too after they have become diseased.

The matter of preventing disease does not usually receive the attention its importance demands.

The course of life and habit, that will secure in the highest possible degree a good state of health and prevent the occurrence of disease, is a subject that ought to be very thoroughly understood. The almost universal suggestion of those who speak or write upon this subject, to keep

the teeth clean, is very good so far as it goes, indeed, this is an absolute requirement if the best health condition is to be maintained, but mere local attention, however thorough it may be, will come far short of securing the best results. Attention should be given to the secretions of the mouth, to the digestive organs, to the respiratory organs, and indeed to the condition of the entire system.

It is impossible to have a healthy mouth, with diseased digestive organs, or indeed with an impaired condition of any of the principal functions of the body; hence, general hygiene is a subject with which the dentist should be entirely familiar, but so rarely is a perfectly healthy mouth with a good set of teeth presented that the greater share of attention must be to those more or less impaired; and here attention to the general condition must be given as well, for restoration or even mitigation of disease in the mouth will depend very much upon the environment. Both local and general treatment will usually be required for the proper management of the diseases of the soft tissues of the mouth.

A very common fault with dentists is the failure to sufficiently emphasize to those they have in charge the importance of care, whether of cleanliness or general attention to health. A part once having been diseased, though the utmost may have been done for its reparation, is subsequently more liable to disease than before it was attacked. For instance, teeth that have been filled and are neglected are more subject to decay than before disease occurred; there are, of course, some exceptions to this rule; there may have been original defects in the teeth constituting vulnerable points for the attack of disease, but every one will recognize that an attack of disease always irreparably weakens the organs, and it is rare that its original integrity can be restored. Under favorable circumstances repair in a large proportion of cases may be in a good degree effected. Not only should great care be bestowed upon repaired natural teeth, but assiduous and persistent attention should be given to all cases where artificial substitutes have been adopted, even the more simple varieties of these, as, for example, a porcelain or gold crown must have intelligent and thorough care if it is to be kept in an acceptable condition; and more care, if possible, should be given to artificial teeth supplied by bridges or by plates.

In the construction of artificial teeth, whether one or many, one of the main points to which attention should be given is such an arrangement as will facilitate the utmost cleanliness and freedom from irritants. This is, if possible, of more importance where a number of natural teeth remain in the mouth. The usual condition attaching to artificial teeth, whether on bridges or plates, is one of impurity and of offense, depending usually to a degree upon faulty construction and adaptation, and too

often with carelessness on the part of the patient. Such a condition is an offense not only to the patient but to his friends and those with whom he comes in contact as well. Doubtless, many a time, patients suffer from indigestion and defective nutrition, the respiratory apparatus also becomes involved, by the neglected and filthy condition allowed to exist in connection with artificial teeth.

The proper construction of artificial dentures for securing the best results in these particulars should have more attention in the future than in the past.—*Editorial in Dental Register.*

OBITUARY.

DR. W. O. KULP.

DR. KULP died at his home in Davenport, Ia., January 12, 1895. Dr. Kulp was born in Wadsworth, Ohio, in 1836. At the age of twenty he commenced the study of medicine, and three years later turned his attention to the study of dentistry, graduating at the Missouri Dental College in 1866. It was through the efforts of Dr. Kulp that the Iowa State Dental Association was organized in 1863. When the Dental Department of Iowa State University was organized some fifteen years ago, he was chosen as lecturer on Operative Dentistry and Dental Therapeutics in that institution, which position he held up to the time of his last illness. He was one of the Vice Presidents of the World's Columbian Dental Congress in 1893. He held a number of prominent positions outside of dentistry and was a man well esteemed. A wife, four daughters, and one son, Dr. J. R. Kulp, survive him.

NEW PUBLICATIONS.

DENTAL MEDICINE. A Manual of Dental Materia Medica and Therapeutics, by F. J. S. Gorgas, A. M., M. D., D. D. S. Fifth Edition. Philadelphia: P. Blakiston, Son & Co. Pub. 1895. Price, cloth, \$4.00.

We have nothing but praise for the present edition of this well known text-book. It has been thoroughly revised and enlarged. Everything has been brought up to date. It is very commendable in the author to bring out so frequently revised editions, for this department of dental science has made rapid progress in the past few years. Practical experience and experi-

mental research are going on with renewed vigor and the profession will feel gratified in having our text books kept up with the times. This seems to be the intention of Dr. Gorgas and we hope it will be fully appreciated by dentists.

In this fifth edition we notice that faulty formulæ of other editions, have been carefully corrected, and many new and valuable recipes have been added, together with valuable tables for preparing per centage solutions, measuring liquids by drops, etc.

Among the new remedies added to the book are: Sodium Peroxid, Pental, Europhen, Asceptol, Glycozone, Coryl, Chlorid of Ethyl, Tropacocain, Kalium Natrium, Trikresol, Loretin, Phenosalyl, Formalin, Diaphtherin, Boricin, Dermatol, Strophanthus, Vaseline, Camphoid, Gaultheria, Catechn, Carbolate of Camphor, Carbolate of Cocain, Eugenol-ascetanied, Electrozone, etc., etc.

As a text-book, and one for reference by the general practitioner it is the very best we have in print to-day and merits a wide circulation.

SOCIETIES.

VERMONT STATE DENTAL SOCIETY.

THE 19th Annual meeting of the Vermont State Dental Society will be held at Brandon, March 20-22, 1895.

Reduced rates on railroads and at the hotel have been obtained.

Some of the best operators have been engaged and we expect to have a very interesting meeting.

A cordial invitation is extended to all members of the profession.

Rutland, Vt.

THOMAS MOUND, Secretary.

TRI STATE MEETING.

THE RUSSELL HOUSE, Detroit, has been selected as headquarters of the joint meeting of the State Societies of Michigan, Ohio, and Indiana, which will occur June 18, 19 and 20. The clinics and literary sessions will be held in the Dental Department of the Detroit College of Medicine and Surgery.

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CONTRIBUTIONS.

THE REASON WHY.*

BY GRANT MOLYNEAUX, D.D.S., CINCINNATI, O.

At the last meeting of this society, I had the honor of reading a paper entitled—"The Articulation of Artificial Teeth." In that paper I attempted to demonstrate that the utility of a denture depended largely upon a correct articulation of the teeth, and that this articulation should consist, not only of a nice adjustment of the cutting edges, but of a careful arrangement of the angles of the teeth with regard to the mechanical forces operative during mastication, and for the purpose of holding the dentures in position during use. However necessary the perfect arrangement of the teeth might be, it is not the only feature governing the successful construction of an artificial denture.

The teeth may be ever so perfectly articulated and the effect partially or totally lost if there is failure to perfectly adapt the dentures to the alveolar ridges and palate. In fact, we consider that the continued success of a denture depends quite as much upon the treatment of the model of the mouth, with a view of effecting a perfect adaptation, as upon any single feature connected with the construction of artificial dentures. By the proper treat-

* Read before the Ohio State Dental Society, December, 1894.

The editor and publishers are not responsible for the views of authors of papers published in the OHIO DENTAL JOURNAL, nor for any claims that may be made by them.

ment of the model, we mean the changing of the shape of the model, not in its entirety, but of certain portions, that will insure at all times, and under all conditions the maximum degree of retention, possible in any given case.

The maximum degree of retention in superior dentures is not the same in all cases, nor is it possible to insure the same results in an unfavorable case than can be obtained in one where the natural advantages were considerable. But, with a full appreciation of the principles upon which the retention of dentures depends, (barring mechanical means,) and with the courage to carry them out to the fullest extent, many cases that by routine methods would be failures can be made to stay firmly in position. There are a great many mouths, the models of which require but little modification to effect an adaptation, while there are many more needing the most extensive alterations to obtain sufficient retention to support the denture, even during moderate use. It is with reference to these latter cases that our efforts are directed, hoping to present this subject in such a manner that the student will comprehend its object, and feel that in each case of artificial dentistry success depends upon individual study.

For a long time two theories have been obtained regarding the force that holds superior dentures in place.

The first of these is the atmospheric pressure theory, and many are the adherents to this belief to-day. The atmosphere under usual conditions exerts itself in all directions simultaneously and its weight or pressure is not appreciated. When for any reason the air should be exhausted from a cavity, as for instance, a cartridge cap upon the tongue, the pressure of the air is noticed by the holding of the cap in position on the tongue. To appreciate the continuous pressure upon the atmosphere, we must be provided with an impervious cavity from which the air can be exhausted. A true illustration of this is the Magdeburg hemispheres an experiment familiar to every school boy. When these hemispheres are placed together and the air exhausted, a force of more than fifteen pounds to the square inch of surface must be exerted to separated them, and they would remain intact indefinitely were not the air admitted by some mechanical means. If instead of one hemisphere we place over the opening of the other a piece of parchment or animal membrane, and attempt to exhaust the air beneath, we find that the membrane will not stand the

pressure of the air and breaks. In order to avoid this breaking we place a column of water in contact with the membrane, and only partially exhaust the air. In a short time it will be seen that sufficient water has passed the membrane to equalize the condition beneath, and that the vacuum has been destroyed and that the membranous diaphragm can be easily removed. Any other fluid would act the same as water, but the time required would depend on the density of the fluid. It is evident, that when the cavity beneath the membrane is filled with fluid as it would be if a complete vacuum were produced, that although the membrane is held in place it is not by pressure of the air. If a partial vacuum be produced beneath animal membrane, it can only be for a short time, as one or two of three conditions will follow. Either air or moisture will pass through; or, the membrane, if sufficiently elastic and the cavity shallow, will fill the cavity completely, together with such fluids as may be in contact with the membrane. All of which is due to the elasticity and penetrable nature of animal tissue, and the action of the atmosphere trying to establish an equilibrium.

The above has been used as an illustration because it is *parallel* to the condition that exists when "atmospheric pressure" dentures are inserted. If we cannot obtain a vacuum above our denture there could not possibly be a sensible pressure on its lingual surface to hold it in position.

When a denture containing the customary vacuum cavity on its palatine surface is inserted, the patient is told to close the mouth and swallow. This act is accompanied by a dilation of the thorax and closing of the posterior nares, which exhausts the air from the oral cavity underneath the plate as well. The air is still farther forced from under the plate, by pressure of the tongue on the lingual surface of the plate. The tongue has no other exhausting power. The air is now nearly all removed from under our denture and it is held for the time by atmosphere pressure partly. If the conditions would continue the same as immediately after insertion, there would be a constant support by the atmosphere, and the vacuum cavity would be the proper thing. Such however is not the case. If we allow our denture to remain in the mouth for an hour or so and then remove it, we will observe that the mucous membrane of the palate has been cupped down to almost fill the cavity in the plate, and that although the tissue

covered by the plate was dry when the denture was inserted, that the plate is now covered with an oily fluid. It is evident now that our plate and mucous membrane are in contact throughout, save the intervening moisture, and that as all our space is obliterated we could no longer have atmospheric pressure, if our illustration is correct. The question now presents itself, how is our denture supported if not by atmospheric pressure?

In an editorial review of Richardson's Mechanical Dentistry, (last edition) one of the dental journals has the following to say:

"Discussing the force which retains a plate in position the author endeavors to show the 'absurdity of the atmospheric pressure theory, and maintains that it is necessary for retention by this means that a vacuum exist, and then proceeds to annihilate the vacuum. We believe he is right in doing away with the vacuum, because if there be a vacuum it will soon be filled by loose tissue and it is evident it could not last long, but we will hold that it is the atmospheric pressure that secures the plate when he refers to it as the 'adhesion of contact.' *What is the adhesion of contact, but the pressure of the atmosphere without a vacuum? It is the same pressure that forces water to follow the plunger up in the ordinary suction pump, that is no vacuum that forces water up, but the water rises to relieve a condition that would produce a vacuum.*" (Italics ours.) The above quotation is given because it is the only argument that has been offered in support of the atmospheric pressure theory, and because it introduces a new phase of our subject. The question and seeming answer in italics, are quite incongruous, as we know, that in order to have water rise in a suction pump, a removal of the air, or pressure above the water must be accomplished, and that the water will continue to rise as the pressure is relieved until the column in the pump equals the pressure of the air, when it will rise no higher, and to keep it there a vacuum must be maintained constantly above the column.

We also know that when two substances with perfectly flat surfaces are brought in contact, that some force is required to separate them; that this force is nothing like the force of the atmosphere; that in some instances it is only a few grains to the square inch, and in others more; that it varies with different substances; that if this force were due to atmospheric pressure it would be nearly constant? and finally that this force is manifest

in the absence of an atmosphere, or in a vacuum, and must be attributed to some power other than atmospheric pressure.

It is called "adhesion of contact," and certainly cannot be the same force as that which causes water to rise in the suction pump.

In any modern work of physics we see under the heading "Molecular Forces," three kinds of attraction, viz.: Affinity, Cohesion, Adhesion.

"The Molecular attraction exerted between surfaces of bodies in contact is called adhesion, and is of three kinds."

Adhesion of solids to gases; Adhesion of solids to solids; Adhesion of solids to liquids.

It is this latter form of adhesion, that of solids to liquids, or rather solid and semi-solid with an intervening liquid, that claims our attention.

To have adhesion, two surfaces must be in contact, and it naturally follows that the more surface in contact the greater the adhesion.

The "adhesion between solids and liquids is greater than between solids." In the experiment of two plates of glass or two blocks of wood, with perfectly flat surfaces, when pressed together adhere with a certain force. But, it is impossible to perfectly adapt two hard surfaces mechanically to each other. If we place a film of water between in order to overcome the slight inequalities, we find the adhesion is very greatly increased. Continuing our experiment we observe that the force required to separate the plates of glass or wood is greatest when exerted at right angles to the horizontal surface; when applied at other angles, the plates will slip or slide on each other and can be easily pulled apart.

Dr. Land in his little book "Scientific Adaptation of Dentures" makes a very practical application of this point.

This adhesion was formerly thought to be due to the pressure of the atmosphere, but as it can be thoroughly demonstrated in a vacuum it must be some other force and is "attributable to a reciprocal action between the surfaces of the bodies in contact." It is beyond all doubt the force of *adhesion* that maintains superior dentures in position, after the mucous membrane and plate are in contact. But, it is through the means of effecting a temporary pressure of the atmosphere, and through the elasticity of

the mucous membrane that we can bring about a condition favorable to adhesion.

To further illustrate our point we will ask the question: If the atmospheric pressure supports dentures, why is it that during febrile conditions when the mouth is dry or "parched" that the patient complains of looseness of the denture? Why is atmospheric pressure not operative now? Why is it that by painting the mucous membrane with a solution of alcohol and water or other stimulants that a perfect adhesion follows?

If we are satisfied that it is the force of adhesion that supports dentures, it behooves us to look carefully to every point that would lessen that adhesion, and improve every condition that would increase it. Adhesion as we have stated, is the result of contact between the surfaces of bodies adapted to each other, but in the mouth adaptation means more than mere contact. An adaptation of two uniformly rigid bodies is at once and all times the same, and pressure at any point on their horizontal surface, would not change their relation.

In an artificial denture we have a uniformly rigid body. In the alveolar ridges and palate we have conditions anything but uniform. We find hard and soft spots arranged where they will be of least advantage. There is also the lower jaw playing over the superior denture at different angles, bearing harder on one point than another, the more compressible places giving way, while the plate rides on the harder points and loosens.

A denture may be ever so perfectly adapted for speaking purposes but when the opposing teeth strike it at different angles, as in mastication, the plate will begin to tilt and loosen, which proves that an adaptation for talking is not necessarily one for masticating. We have seen plates tried for their "sticking" qualities by pulling on the anterior teeth. There is an exhibition of the force of adhesion under the most favorable circumstances as all hard parts are relieved and the retention is that due to contact between mucous tissue and the plate. If pressure were exerted in the bicuspid region or anteriorly, the denture might not stick so well.

Now, with a view to obtaining the greatest retention in superior dentures one or all of four forms of treatment in the model may be necessary. First, treatment to relieve pressure on the hard parts, by thickening the tissues over these points.

The hard parts are usually found in the median line of the palate, and over the ridge corresponding to the position of the two bicuspid and first molar teeth, called "buccal region." The tissue over the regions corresponding to the six anterior teeth and at the tuberosities is generally more compressible.

The amount of relief over the hard parts would be governed by the compressibility of the softer portions.

Second. Treatment to produce as much horizontal surface as possible.

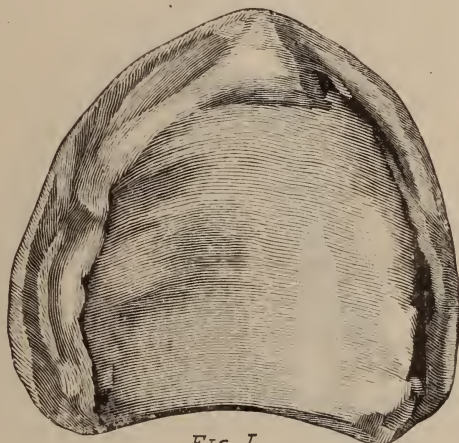


FIG. I

Third. Treatment to restore the model to the size of the mouth, or as nearly as possible.

Fourth. Treatment by relief, to produce in extremely hard, flat or angular mouths a thickening of vascular tissue, over the entire palate for the purpose of obtaining more moisture, and a soft elastic padding for the denture to rest upon. Incidentally, reliefs are applied to models for the purpose of preventing pressure on points undergoing absorption, as well as points tender from surgical operation; also, to protect models from influences that might injure the model during the process of constructing a denture. In brief, we desire to obtain a uniform padding of vascular tissue under the denture, that will prevent fulcrums and friction on the hard parts of the ridge, and the consequent injury resulting from this continual irritation. Also, to obtain all the horizontal surface possible. The paper can be better understood by referring to some practical cases.

Fig. 1. This is a flat mouth, all horizontal surface, and

thickly padded with soft tissue over ridge, median line and entire surface of palate. There is nothing to be done to this model in way of reliefs, for there could be no improvement. A denture made for this case will be worn with unusual degree of satisfaction, providing there is a fair occlusion with opposing teeth. The only treatment that we would suggest would be the tinning of the model with No. 40 foil to protect it in case of a vulcanite denture.

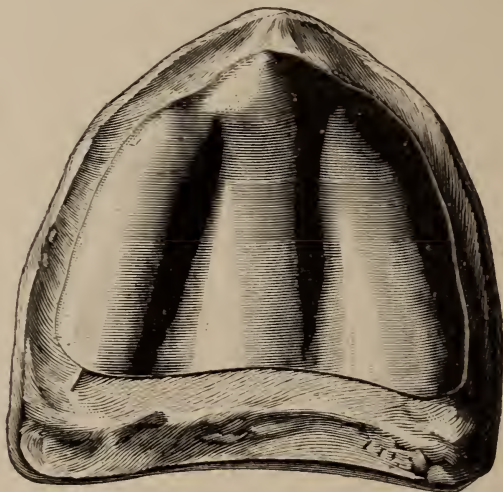
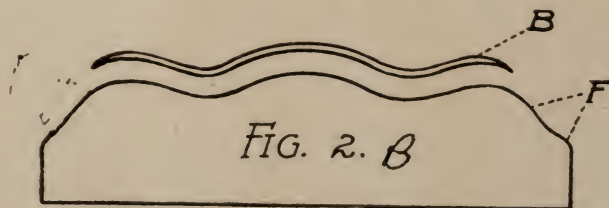


FIG 2

Fig. 2. This is also a flat mouth, representing more horizontal surface than Fig. 1. But in place of the soft vascular covering to the ridge and palate, we find the mucous membrane almost without color, it is so thin. It is also very dry, having a glazed appearance and the buccal and labial side of ridge offers no assistance to support the denture, as this is angular.



This patient tried a number of operations but without good results. The plates when moistened would adhere fairly well for speaking, but even then would frequently drop. The treat-

ment for this case according to our paper was to extend a relief over the entire palate of about 26 gauge, terminated at the junction of the palatine, with the labial and buccal surface of the ridge, and posteriorly at a line where the tissue was soft. The extent of this relief is shown in Fig. 2.

Fig. 2 B. Is a vertical section of Fig. 2, and shows the relief B raised from the model.

The effect of this treatment was to bring positive contact at the circumference of the plate between the dotted line F, and to extend the plate as high as possible at the incisive and canine fossæ and over each tuberosity. The space occupied by the relief B, was soon filled with tissue and an excellent adhesion was the result.

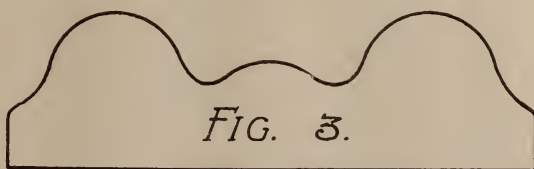


Fig. 3. This is a model that first would appear simple, yet it was the source of much trouble to several operators. The trouble was not the lack of horizontal surface but the uneven distribution of soft tissue, and the resulting fulcrums. Anteriorly and posteriorly the mouth was soft, while in median line and buccal region the tissue was almost white it was so thin.

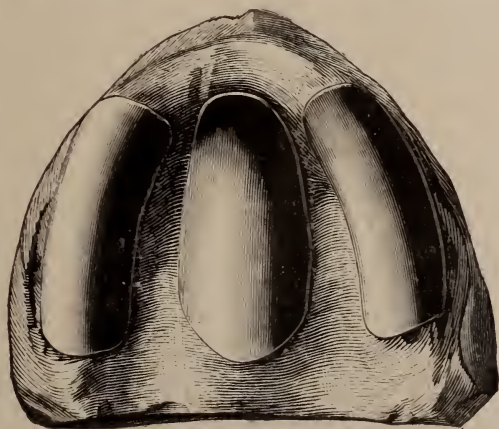


FIG. 3A

The treatment of this case was to pad the three hard points by placing relief as indicated in Fig. 3 A. As the space between the lateral and central relief in this case is very slight, and as the application of three reliefs would make several edges to irritate the tissue, we would suggest that the case be treated as in Fig. 3 B, with one relief covering the three points indicated in Fig. 3 A.

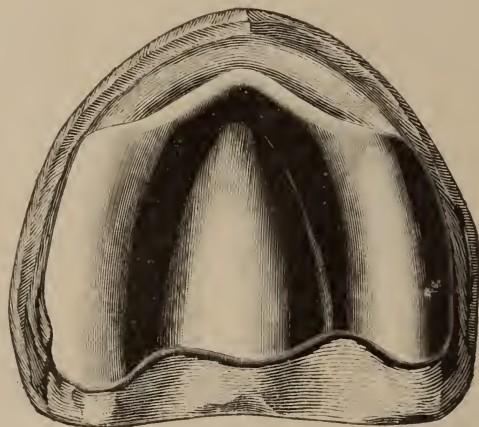
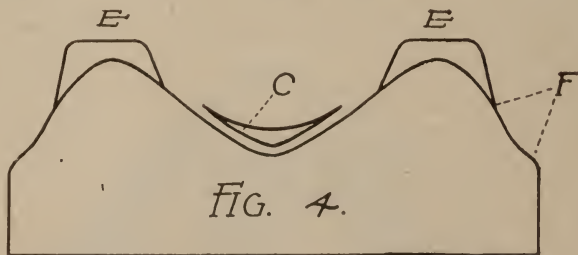


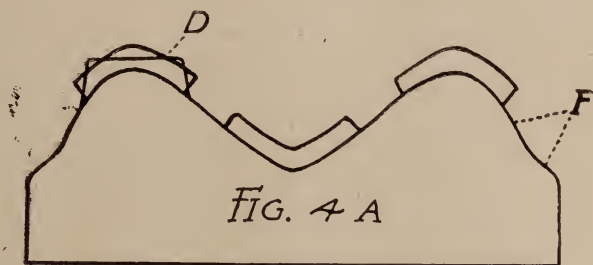
FIG. 3 B

Fig. 4. This is the vertical section of a V shaped model, and will be recognized as one of the most difficult mouths in which to obtain a satisfactory degree of retention.



The manner of treating this model is shown in Fig. 4. The reliefs are adjusted; first, to prevent pressure on the least compressible portions; second, to create horizontal surface over the angles as shown by the shape of the reliefs in the diagram. By placing reliefs of uniform thickness as shown in Fig. 4 A, we prevent the pressure of the plate on these points, but we do not materially improve the conditions for adhesion as regards hori-

zontal surface. The combined horizontal surface of E. E. C. Fig. 4, is quite that of the average mouth, and we have reason to believe, other conditions being equal, that a fair degree of retention will follow. These reliefs have been somewhat exaggerated in the drawing, it was not intended for them to appear quite so heavy.



Treatment to restore the model to the size of the mouth is advocated for vulcanite. The great trouble with vulcanite plates is that they are generally too small for the mouth, and that "misfits" are due to the fact that some mouths cannot be forced into the plate.

It is quite often that when a denture is first inserted that it will not readily go to place. The dentist helps matters along by vigorous stroking of the lingual surface, all of which is to crowd the mouth into a plate that is entirely too small for it. Such a denture cannot be worn without injury. From the time we take the impression, both by our own acts and those changes that take place in the materials with which we are working, we are getting farther away from the size and shape of the mouth, and a certain amount of alteration is necessary to prevent these changes from effecting the adaptation of the plate.

We have long advocated the use of No. 40 tin foil over the models for vulcanite, and we know that if every vulcanite plate were made on a model tinned with No. 40 foil, that infinitely better results would follow than by the use of silex or collodion. When reliefs are to be placed on the model, they should be placed first, and the foil stenciled over them and the model.

The foil answers another purpose. During vulcanization when the rubber is expanding with great force, followed by its subsequent contraction and shrinkage, the model is protected from injury. (We cannot at this point refrain from recommending the

careful study, by all those interested in vulcanite, of the papers by Dr. Geo. Snow in the *Dental Advertiser* of 1887.) The reliefs spoken of, are formed of block tin and tin foil, ranging from No. 40 foil to block tin of 20 and even 18 standard gauge, in thickness. They are placed on the model as indicated by an examination of the mouth. The edges are beveled and no abrupt margins left to irritate. The tissue thickened in this manner, after a time becomes permanent, and remains healthy.

We have never seen a case where the judicious use of reliefs ever produced harm. On the contrary, the patients who have experienced trouble appreciate to the highest degree this careful attention. It is not infrequent to find operators of years experience claim they have never used "air chambers," who at the same time tell how they shave the impression.

Now it does not make any difference whether you shave the impression or add to the model, the results are the same, though the object of the operators may be different.

We do not approve of the old fashioned vacuum cavity with its sharp edges, as its only action is one of relief, to prevent pressure on the hard parts, and after these parts have been relieved let the edges be drawn out so that they are continuous with the model and not to be seen or felt. The form and thickness of reliefs are to be modified according to the material used in constructing the base of the denture, and to the conditions found in the mouth, and its shape.

A model for vulcanite or cast aluminum might require a little different and more extensive treatment than a model for a gold plate. A model for continuous gum would be different than either of the foregoing, but the principle involved in each case is the same.

We approve of adding to the model because the changes can be made more accurately and the reliefs can be blended off with the model so that their margin cannot be distinguished, and consequently, mechanical irritation will not occur.

My apology for this paper is the number of cases I have seen by reference and consultation demonstrated that there are many not acquainted with the possibilities of prosthetic dentistry and this is offered as a partial solution to "THE REASON WHY" of some of our failures.

DISCUSSION.

DR. AMES: I do not like to take the floor so often, being a visitor. The reading of Dr. Molyneaux's paper interested me very much, since the adaptation of dentures and the utilization of atmospheric pressure is one of my hobbies. Before the reading of the paper I was speculating as to what Dr. Molyneaux might have to show us, and I assure you that it was a revelation to hear him tell that he could accomplish this change of form of the alveolar ridge by cupping down the tissues as he described. Of course we have all seen the tissues cupped by the ordinary air chamber and become quite firm, but I must admit that to cushion up a plate, as he does, never occurred to me. There are some points, however, on which I must differ from Dr. Molyneaux, for he says that atmospheric pressure will be manifested without an air space, and also that the utilization of atmospheric pressure is impracticable, because the tissues will either be drawn down or will have fluids drawn from them to defeat the purpose. This is practically the ground taken as I understood him. Now, I will not quarrel with anyone about the capillary force and the adhesion of contact of moist surfaces, but what I want to claim is that if one only utilizes these forces in the retention of artificial dentures, they do not accomplish the *maximum retention*. If a full upper denture is so constructed that it extends in all directions far enough, so that the entire periphery of the plate rests against and slightly displaces lax yielding tissue, we will not only get the adhesion of contact to retain the plate at ordinary times, but retention from atmospheric pressure at times when there is such pressure applied as would break the contact if the plate were not extended upon the lax tissues at its entire periphery, by which means the air is prevented from readily passing beneath the plate as it would otherwise, and there is a *tendency* to the creation of a vacuum. There is not a *vacuum*, but a tendency to the creation of such a condition only, because the leverage is such that the entire or full atmospheric pressure of fifteen pounds to the square inch is not required to prevent the denture from coming away from the surface of the jaw. Dr. Molyneaux rightly states that the tissues will not tolerate a vacuum. While under the conditions ordinarily met with in connection with the wearing of dentures, there is not sufficient traction brought upon the tis-

sues, when the denture tends to leave them, to cause rupture of the capillaries. I have repeatedly caused the rupture of the capillaries of healthy tissue during demonstrations of this principle, by means of a denture having attached to it, near the second molar of each side, a strong twine, by means of which sufficient traction could be brought upon the tissues by a *tendency* to the creation of a vacuum to cause a rupture of the capillaries, sufficient blood flowing therefrom to admit a breaking of the joint at the edge. The Magdeburg hemispheres I do not consider an illustration of what can or cannot be accomplished in the mouth. The illustration does not fit the case. I see where a great deal of good can be accomplished by the system of relief so ably brought out by Dr. Molyneaux, and I am very grateful to him for the points I have gotten in this line. With this cushioning up of such angular jaws and the carrying of the plate to the soft tissues, in all directions, the maximum of retention will be such as to surprise most operators. To carry out the plans I am advocating, a very carefully taken impression is called for. If the patient has an old denture I generally use this as the tray, extending it back with wax, if necessary, to get an impression of sufficient surface. If there is not an old denture available, an impression is taken in the ordinary way, a model made and over this a blank or base-plate is formed, using the "Ideal Base-Plate." Trim the edges of this so that it does not press against and distend any of the tissues of the lip or cheeks and extends a little farther upon the soft palate than it is desired to extend the plate, which is to simply reach to the soft palate. This base-plate used as an impression tray—using soft plaster should give an impression without putting any of the tissues upon tension, *i. e.*, without stretching any of the soft parts out of the natural position. By making a model from such an impression the rim of the plate can be made to nicely fill in all space between the jaw and the lip and cheeks, so that no air can enter at part of the periphery of the plate and by grooving across the model from a point outside one tuberosity to the same point on the opposite side, following the line of the beginning of laxity of tissue, the joint will be complete throughout the entire periphery. A very large majority of mouths will tolerate such a denture comfortably. In an occasional rare case other and more complicate means must be resorted to for accomplishing this satisfactory retention.

Dr. MOLYNEAUX, in closing the discussion, said that the models used to illustrate the paper were prepared especially for vulcanite work, but that the principles were involved in all kinds of dentures, but modified to suit the material and method used. Vulcanite work has done more to ruin mouths than anything else, not so much on account of the vulcanite, but the careless methods of using it. Vulcanite is an excellent base when properly made. I believe that much of the bad results from vulcanite are due to the interference to nutrition which follows the insertion of many vulcanite plates made directly over a plaster model. The plate is too small for the mouth and the tissues must be cramped in order to get the denture in place. Another trouble, "rubber sore mouth," I have often seen corrected by simply making a vulcanite plate with self-cleansing surface, such as is obtained by vulcanizing against thick tin foil.

Dr. —: Suppose you show us how you put your tinfoil on the model.

Dr. MOLYNEAUX: If the society wants to be detained a little longer I will show that for the benefit of those who might not understand it. Putting on the tinfoil is a very simple process. I have been accustomed to use both Ashmead's and Nye's tinfoil. I suppose any other would do as well. Take any form of model you like and a number forty tinfoil or number sixty. You put reliefs on the model wherever indicated. You take shellac, of the consistency of thick syrup, and cover the model or that part of the model you want the plate to cover; then you take your piece of tinfoil, one sheet, that is number forty, laying it over the model. Take a stencil brush, with quick successive taps and stencil the foil until every portion is in contact with the model, then with a piece of chamois rub over a couple of times until smooth. If you use a burnisher you cannot get it down for a long time, and also get it full of wrinkles. You trim off the excess and then take your burnisher and go around the edge and if there be any wrinkle, as there might be, rub it down, and if you leave any impression of the stencil brush, the rubbing with chamois brings it down perfectly to the model, and you have a smooth surface. If you use a thinner tinfoil than forty it does not act as any protection to the model at all. Putting your shellac on first and then taking your sheet of tinfoil and going down over the edges in that way, you see it is over there per-

fectly smooth, and by rubbing it down with a piece of linen or something you have handy, it gives a surface on which you can vulcanize. The use of the stencil brush is an important thing. If you use thin shellac it will not hold the foil.

THE ELECTRO-CHEMICAL THEORY OF DENTAL CARIES.

BY S. B. PALMER, M.D.S., SYRACUSE, N. Y.

THE saying that "history repeats itself" seems applicable to the fact that after nearly twenty years the Electro-Chemical Theory is again under discussion. As the writer is held responsible for the introduction of this topic, he is thankful for the privilege of stating to a new generation of dentists, distinctly what it claims, and what he believes, demonstrated in his own practice. Any one who will read the digest of a paper read by me at the meeting of the American Dental Association and published in the January number of *The Dental Digest*, will see that the resurrection of this subject came not from the writer. It is clearly stated in the review referred to that the "Electro-Chemical theory has no ground to rest upon."

This is not the time or place to answer the criticisms set forth in *The Digest*. Nor do we need to enter into controversy. The readers of THE OHIO DENTAL JOURNAL may judge of the merits of claims and the practice set forth under the theory mentioned, which in *accepted practice* are denied as having no foundation. We rest the case with Science, and proceed to give some of the fundamental principles upon which the theory rests with practical demonstrations.

The Electro-Chemical Theory believes that the filling of teeth can be reduced to a science, and the laws governing operations so well understood and taught, that a graduate may enter upon practice with the same assurance of success, that he feels in entering the infirmary with the knowledge gained in the technical department. Experience from practice comes with gray hairs. It believes that the insertion of a filling into a cavity, institutes a cause, the effect of which will be, according to physical or chemical laws, which will terminate in effects according to the conditions. *It believes that the same effects will follow like conditions*

with like materials. It believes with a proper knowledge of cause and effect, filling materials may be so adapted to the conditions of the teeth that the best possible results may be obtained.

PRACTICAL APPLICATION COMMENCING WITH GOLD.

It is an established fact that gold properly inserted into a tooth of normal structure preserves the organ, and, under the circumstances, we have no other material that all around is its equal; as the density of the dentine shades below normal, gold becomes less reliable for teeth preservation, until we reach the other extreme, young teeth, and others poorly calcified, when gold not only fails as a mechanical stopping, but it becomes an agent of destruction to that condition of dentine. To make this statement clear, we must give some of the rudiments of the theory under discussion. We cannot proceed with filling without involving some of the laws of the electrical theory, and our present method of involving knowledge, is to make a definite statement and then try to prove it.

Every tooth which is filled with a metal filling where the dentine is below medium density, becomes a battery, unless some precaution has been taken to insulate or polarize the elements. This brings up an important question to be disposed of before we can go farther. There are various kinds of batteries, but the principles upon which the elements work in connection with the exciting fluid, are the same. The battery in question consists of a negative element, which is gold, conforming to the copper in ordinary batteries; a positive element corresponding to the zinc, in the organic constituents of the dentine, while the moisture which fills the dentine is the exciting fluid.

On reading the comments on my paper, in *The Dental Digest*, it is inferred that there is but one phase of denial caries, all being included and settled in the conclusions of Prof. Miller. The Electro-Chemical Theory presented another phase of caries eighteen years ago, and still holds to that belief. It becomes necessary to mention this matter of history, because the defenders of the modern idea, seek to cover the whole ground, by claiming that "The Electro-Chemical Theory has no ground to rest upon." This, however, is not worth an argument. It stands upon science and natural laws and will prevail. All are acquainted with the accepted etiology of caries which commands respect

due for the earnest scientific work it has cost. Let it be understood that the writer's views in no particular clash with the accepted conclusions. To make it plain in a few words, "decay of teeth is essentially the result of micro-organisms, through their excretory products."

Secondary Decay, (that is decay around the metal fillings,) may or may not include the causes which produce decay in the first instance. It includes *more*, as we will endeavor to demonstrate in practice. To use a figure, fire consumes fuel burning in the open air; the consumption is increased by a chimney or blast pipe.

Chemical activity in liquids generate electricity. Oxygen generally plays a part; it is a fire without a draft, a battery without poles. Immerse two dissimilar metal plates into the liquid; the one most oxidized is the positive element; the other becomes charged with electricity, and it is said to be of higher potential than the other. This occurs when the two plates are not connected. The negative plate soon reaches its maximum potential when the action on the positive plate ceases. When the two plates are connected the potential runs down, a current is set up and the positive plate is dissolved to supply the current. These are plain principles and applicable to the action in the oral cavity. There are two conditions to be observed; one makes a tooth filled with metal a battery; the other is not a battery. The trouble in presenting this subject is, that those not conversant with the study gets the conditions mixed, which is equivalent to crossing wires. Here we must introduce another term involved in decay around fillings. That is, *Electrolysis*. We will not consume time in teaching this phase of galvanic currents. If a binary compound in a liquid state has a current of electricity passed through it it is in general decomposed into its constituent elements, one of which appears at each of the points where the current enters and leaves the liquid. No elementary substance can be an electrolyte. Electrolysis only occurs while the body is in a liquid state, or with moisture sufficient to allow mobility of molecules. Electrolysis occurs in viscous solids in proportion to their fluidity. Thus, a normal tooth is not an electrolyte, because it is so dense as to forbid circulation while a low grade of dentine is an electrolyte in proportion as it permits mobility.

Let us apply these points to practice and see if there is not

an argument with the experience of the reader. Normal teeth properly filled with gold, may last the life time of the patient, and under those circumstances we have no other material to equal gold. On the descending scale (for we must get the lesson from the extremes) gold is sure to prove a failure, from a principle as well founded as that which insured success. Practically what is the cause? and quite as important, what is the remedy?

We need not use valuable time in giving the reasons why gold preserves normal dentine. One principle should be borne in mind that when a metal filling is placed against sensitive dentine which in a short time fails to respond to thermal changes, the experiment means surface devitalization and not calcification as would occur under a filling of gutta-percha.

In case there is sufficient mineral matter to protect the organic portion as in case of normal dentine, nature repairs up to the dead line which is so thin and dense that the lining is not decomposed. When the dentine becomes an electrolyte by reason of moisture, devitalization penetrates deeper, and decomposition is the effect.

I desire to be understood and not have the subject injured by prejudices against the Electro-Chemical Theory as some entertain. Therefore I will use the term thermal change, instead of electric current. Heat being another condition of electricity as those understand who use a mouth lamp.

The metal by conductivity produces electrolysis of the organic constituents of dentine, the same as from the electrical potential, generated by chemical change, both heat and current pass through the metal and carry on the process of decay with an energy not present with a non-conducting filling. This principle is denied by those who object to electrolysis as a factor in caries, consequently they have no need or use for insulators under fillings which are to rest upon frail dentine. It is not my motive to defend or support a theory beyond its practical advantages over the accepted etiology of caries. It does not clash with anything that has been given for the preservation of teeth. We illustrate from our practice the benefits of cavity linings of various kinds, used to meet the conditions of dentine, nearness to pulp, etc. Could there have been harmony in the work, and as strong support of facts been given in the investigation of the theory under discussion as has been bestowed in its suppression, filling teeth would

be resting upon a scientific basis, and students would be taught laws which would guide them in operations as correctly as in other sciences.

Look for a moment at the evolutions that have taken place in my practice. The test was made on amalgam, over gold, for preserving frail teeth. The principle taught then and now, is that by chemical activity amalgam becomes corroded and imparts metallic salts to the dentine, being oxides, sulphides, etc., which enter the tubuli and fill the spaces which in normal dentine is filled with the lime constituents. The salts, with the organic element form an insoluble compound and thus decay is arrested. What really occurs is the same that takes place in a battery with copper and zinc elements in a liquid of sulphate of copper; when the copper becomes attached to the zinc, the plates are said to be polarized, equivalent to two plates of copper and the current ceases. Thus it is that amalgam containing copper is used instead of silver and tin with gold or platinum. As the alloy approaches gold in its resistance to oxidation it loses its virtue in the filling of the dentine. The color imparted to dentine which is in the condition to be preserved by it is disagreeable; besides, in large shallow cavities in molars with slight undercuts, especially where the surface is covered with softened bone, this principle often fails to meet expectations, because, when moisture reaches the filling, which it will before the mass becomes hard, by capillary attraction, the entire surface of the bone under the filling is wet. No perfect work in inserting can overcome this law; the effect in this action is at once set up, upon the surface of the amalgam next to the dentine on the plug itself, between the fillings or shavings of the alloy, and that portion which is already amalgamated. The decomposition is so rapid that by the acid the lime in the bone is dissolved still more, the metallic salts are wasted instead of filling the bone as would be the case in smaller cavities in more dense bone. To meet this condition I use a lining of cement the same as would be used in setting crowns, only mixed thinner. Mix the amalgam then, dry the cavity, paint the surface as thinly as possible with the phosphate, introduce the amalgam and with a ball burnisher go over the surface, working from center to margin in a manner to force out all the cement possible, clean the enamel borders of cement and finish the filling. There are several points gained by this lining. There will be no mois-

ture between the filling and walls of cavity, the dentine will be sealed perfectly; the surface of amalgam will also be protected from the chemical change already mentioned. And another consideration, an amalgam which is placed upon a lining of cement, varnish, tinfoil, or into a cavity of normal density does not discolor upon the outer surface like one undergoing electrolysis upon the hidden surface, except in cases where the filling touches gold; then we expect to find the surface black, because of a law which debases the positive element as it exalts the negative in all battery elements. Zinc is used to raise the standard of iron. Iron covered with tin sinks below the normal standard as may be seen when the coating is imperfect. Copper when placed with gold or platinum, is much reduced in its rating. An amalgam is not a homogeneous mass; there are currents and counter currents upon the surface; when that takes place upon the hidden surface, all the elements are affected which accounts for discoloration on surfaces where vigorous action is going on beneath. We mentioned the benefits of blending the elements which produce currents upon the surface of amalgam with cement. Another practical lining is found in tinfoil. We have no better metal for tooth preservation than tin, and it is coming into use now that it can be used cohesively in shavings. Tin is a poor conductor and oxide of tin is white and with dentine is insoluble under fillings.

Could we use an amalgam of tin and mercury we could depend upon it for its preserving properties. When a cavity is prepared for amalgam take a small piece of tinfoil, no matter if it be two thicknesses, lay it over the cavity, and with a ball bur-nisher form a lining—no harm if the tin overlaps the enamel. Fill up to the enamel and remove the rim of tin, which will readily come away on a line with the filling; finish the filling without exposure of the tin, and there will be, in effect, a tin amalgam filling and more, the currents mentioned between the particles of alloy, and mercury will be blended. So there will be little chemical action on the plug on the surfaces touching the dentine. This brings us to the most practical illustration of Electro-Chemical teachings; insulation instead of antiseptic treatment. We do not underrate the latter for the conditions where antiseptic treatment meets the demand. The Electro-Chemical Theory teaches that there is a demand for insulation while the accepted etiology of caries recognizes no such demand. Re-decay

or decay around conducting fillings is an established fact, it is based upon well known electrical laws, governing electrolysis. A mere denial of such laws will no longer satisfy the coming dentist as he becomes acquainted with oral electricity. When a cavity is prepared for filling a strong glass presents a roughened surface the more so as the dentine is less dense. When such cavity is filled with gold, tin or amalgam, there are fine scratches from the instrument as well as of the open tubuli which are not filled, and as previously mentioned, moisture by capillary attraction fills such spaces. As we have stated, heat is another phase of electricity; also by chemical activity in the mouth, by acids and food containing carbon, chlorine, etc., the filling stands at a higher potential than the positive elements such as organic constituents of dentine. In all low grades of dentine disintegration occurs by the current conveyed through the plug to the moisture and animal matter lining the cavity, with results discouraging to every operator who believes that "failure is due to defective manipulation." So far as I can determine it is better that this space be filled with a substance of low conductivity and one which prevents chemical change by excluding moisture. I have found nothing better than chloro balsam. I have used paraffin which is a good insulator but objectionable on account of the smooth surface given to the dentine which renders it more difficult to retain the first few pieces of the filling. I believe that all metallic fillings, as well as gutta-percha, are improved by a thin lining of chloro-balsam, copal, ether, or some like varnish for reason already given, except for contour fillings of gold. Care should be taken that enamel which is to retain the plug is not coated with varnish or paraffin; there will be no mechanical bite of the gold with the enamel; no friction other than undercuts. For gutta-percha, those who have not used it, have missed a great helper. In a varnished cavity each piece of filling unites with the varnish, and is held until other pieces are added, and when the filling is completed the surplus can be cut away without drawing the filling from the walls of the cavity. In this way a gutta-percha filling can be inserted which will not leak. It is true that there are some who do not recognize secondary decay as differing from primary decay. Practical cavity lining, if the work is done the same, the same effects will follow without a knowledge of science.

As re-decay is accelerated by electrolysis caused by currents generated from galvanic action by reason of the fillings, there is a demand for knowledge how to insulate such currents and thereby prevent decay.

We have briefly stated the outline principles of the Electro-Chemical Theory, and connected these, with practical suggestions how to meet such demands, trusting that the reader may be benefited thereby.

THE UTILITY OF ANATOMICAL TECHNOLOGY.

BY HENRY BURCHARD M.D.. D.D.S., PHILADELPHIA, PA.

THE history of the colonization of Ohio shows that its settlement was made by men who had the sense to recognize a good thing when they had found it, and after finding it the energy to hold on to it.

This acumen has become hereditary among Ohioans; and now, in every place where shines the reflection of the silver goose on the Bland dollar, the people have grown accustomed to find good things innumerable come out of Ohio.

Among these good things may be fitly placed a paper by C. M. Wright, in the OHIO DENTAL JOURNAL for January, 1895, "On Some Thoughts on Teaching Histology and Anatomy in Dental Colleges."

The doctor has stated explicitly that the impressions and expressions are those of thoughts and not of opinions. He is to be congratulated upon the consistency with which he maintains the distinction throughout.

Where is there a man among dissectors who has not a responsive chord when Dr. Wright calls up the ghostly forms of the ghostly parts of past anatomical experience in these post-prandial thoughts of his? What does he mean by forming his impression through the aroma of a café noir? As for his Roquefort? Well! it is applicable; for through at least one of our senses it will keep us to our subject (and incidentally remind us of subjects). The thoughts as he describes them, "shimmering vapors of scintillating nerve-cells, stimulated by a commingling of past and present impressions," and he has drawn it as seductively as could Ik Marvel himself.

This presents one side of the erratic cerebration implied.

There is another aspect of the thought question, but it involves, also, opinions.

For some years, as that immortal creation of Dumas', Chicot, would say, "I demonstrated anatomy in my funny little way."

During this period of olfactory insults, observations were made and opinions formed which were and are at variance from Dr. Wright's thoughts. Lest any statement here be misleading, it is presumed that no doubt his own opinions are not the *thoughts* of the essay.

First and foremost, I found that students who were well qualified in anatomy were, as a rule, well grounded in other branches. To be sure this may mean alone, that apt men are apt men. Aside from the acquirement of anatomical knowledge, *per se*, the study of anatomy engendered in the student a habit of close attention. So that merely as an excellent mental training the study is invaluable.

Dissecting is the only means of acquiring really applicable anatomical knowledge. Throughout the whole manual training idea there will be found no more applicable item than this one; for to know anatomy his own hand must do the anatomizing. Without this, he has not that panoramic view of anatomical parts which spreads itself before the psychological eye of the practiced dissector.

It may sound like a paradox, but no man can know the anatomy of the head unless he know that of the foot. Apropos of this, a dental student's first part should be an arm, second a leg, and third a head and neck, and next the viscera.

It may be a dental practitioner will not find use for one-tenth the anatomy taught or presented to him, and yet even the other nine-tenths may not be useless. It may serve as one of those emergency provisions which will determine his right to the title of professional man.

In any of the fundamental branches of medicine it may be that individual items will find no direct application; but anatomy as any of the others serves as a basis for induction and deduction, and in all reasoning as to medicine we must come to these bases. The history of any branch of learning will show that the worth of inductions relating to it, depends primarily on the soundness of premises, and without a stable premise, one may induct until he is gray, and his result is—what?

In the matter of microscopical technology Dr. Wright's criticism assumes more the shape of an opinion, and the implied charge is a true bill. The cure of the matter, however, should be found in construction not ablation. Even a little practical instruction in this direction is better than none at all. There is no reasonable reason why it should be little, for it is quite possible to have extensive enough a course provided by colleges to make a student something of an adept in microscopical technology. Given a fair basis, he may make his own observations as to anatomical changes due to pathological processes. The only way to familiarize him with pathology is to have him see, and think from what he sees; and to know abnormalities he must know the normal.

Complete familiarity with these matters is not an ornamental accomplishment, but almost an absolute need for the practice of thoroughly rational therapeutics. The deduction is that therapeutics, actual practice, is based upon these things, and it is well directed just to the extent of the foundations.

I hope the day will come when every dental graduate will own and use a 1/14" Zeis's homogeneous immersion objective, and may the day come before a better glass displaces this one.

That in the near future when every dentist will have a pathological laboratory attached to his office.

May it not be far distant when he will divide the inferior maxillary nerve at the foramen ovale, with the same confidence that he now extirpates the pulp of a tooth. May the era be impending when he will operate for extensive maxillary necrosis, or for the removal of neoplasms with the same decision that he now yanks a useless molar.

We are on the way to great things. They may be long in coming, doctor, but come they must, as sure as rent day and local anesthetic peddlers.

PRESIDENT'S ADDRESS.*

BY CHARLES F. THWING, D.D., LL.D., CLEVELAND, O.,
(PRESIDENT OF WESTERN RESERVE UNIVERSITY.)

I HAVE recently been turning over the two volumes written by the cultured and eccentric Dean Burgon. They bear the title, "Lives of Twelve Good Men." These men are all dead now and the author himself has joined those of whom he wrote. But I wish to make the book the text of what I want to say upon this occasion. Perhaps the title of my address may therefore be said to be, Some Minor Conditions of Professional Success. I say "some," for I am too merciful a man, I trust, to speak on all these conditions, even if I had the ability to find these precious things. I also say "minor," for I presume that every one would affirm that the major conditions are a trained mind, a strong will, a vigorous body, a high faith. But my purpose and method are of a simple sort.

The first condition which I name of professional success is what I shall call living under the best associations. These twelve men, of whom I just spoke, had spent some part of their lives at one of the great and old English universities. Several of them lived and died in academic groves. Their environment was the richest historical associations. Walks made sacred by the foot of Addison, and bearing his name, they walked in. Halls made holy by the student days of Milton and Tennyson, they dwelt in. Libraries, the accumulations of the nobles treasures of hundreds of years, were their pastorages. Chapels and churches and other structures, marking by their architecture their ancient life and preserving the elements of this life, were their meeting places. Associations pure to the feeling, impressive to the historical sense, captivating to the taste, inspiring to the intellect, were to them as constant and captivating friendships. No wonder, you may say, these men were "good." Such associations and conditions we cannot create at once in this new world of ours, for they are in part the product of time, and our time is in the future not in the past. But associations the best which we can

* Address delivered at the Commencement Exercises of the Western Reserve University, Dental Department, at Cleveland, March 5, 1895.

command we are to make ours. The best associations of friendships, of the fine arts, of the churches, and of the libraries, we are to create and to foster for ourselves. There is a special need of such associations for those who are to enter the professions, for most lawyers, doctors, dentists, architects, editors, are not what we call liberally educated men. They may be men of the learned professions, but they are not themselves learned. Outside of the ministry we all lament that the tone of the general culture of the professions is exceedingly low. It is no higher, certainly, among ourselves as dentists than among other professional gentlemen. Therefore the need is urgent that you should make your associations the highest in moral tone, the most culturing to your intellect, the most enriching to your heart, the most arousing to every power. Of many ways no way is more open, it seems to me, or more useful than that which is embodied in the book. I was recently speaking with an eminent physician about a certain dentist, and I expressed my confidence in his culture and ability. "Yes," was the response, "his pastor put him to reading years ago and now the results are apparent." For the book is life. Into the book has been poured all that the imagination has created, all that scholarship has gathered, all that history has recorded, all that science has commanded. Parnassus, says John Paul Richter, gives a wider prospect than the throne. Macaulay, in writing to a little girl, many years ago, said: "If any one would make me the greatest king that ever lives, with palaces and gardens and fine dinners, and wines and coaches, and beautiful clothes, and hundreds of servants, on the condition that I should not read books, I would not be a king. I would rather be a poor man in a garret, with plenty of books, than a king who did not love reading." Few of us are capable of being so absorbed in books as was the great Whig historian, or of absorbing so many books, but this inability does not prevent us from putting ourselves under the best association of books. Of course there are books and there are books. Of course, also, we are not, to change a figure which Mr. Lowell uses, to go down to live in the cellar of literature. We are then rather to mount to those fair upper chambers which look toward the sunrise of that Easter which shall give a resurrection to the soul from the body of this death. Of course the best books we are to read, for the best books, alone are worthy of helping to form a part of our best

associations. The book is to us the college, the university. Carlyle has said that a great library is simply a collection of books. But many of us who have not the formal relation to a university may have the real or at least the best part of a university through the proper use of books which lie open to our eyes.

The charge is sometimes made that dentistry is not a profession, that it is a trade, that it is a work purely mechanical; but the remark is not true. But the reason of the remark which is made is that some who have operated on the teeth have been more mechanics than dentists. But whatever reason for the remark has existed you are to remove by making yourselves worthy members of a profession, and this worthiness consists in no small degree in your living under the best associations, in your cultivating yourselves with all those helps which the new world and the new education offer.

As I read these volumes of Dean Burgon and also the lives of other good men and great, I find I think that these men did the best that was in them to do. Limitations they, like all, had, but in their bounds they thought and willed the best possible. Mr. Lowell once wrote to his friend, Mr. Charles Eliot Norton, about his poem, "The Cathedral." It would seem that Mr. Ruskin had expressed a liking for the great poem, but also had expressed the belief that the poem needed revision. Mr. Lowell wrote to Mr. Norton, as follows: "Now Ruskin wants me to go over it with the file. That is just what I did. I wrote in pencil, then copied it out in ink, and worked over it as I have never worked over anything before. I may fairly say that there is not a word in it over which I have not thought, not an objection which I did not foresee and maturely consider." Such patience of endeavor, such detail of study, such height of aim, such willingness to be content only with the best is to be yours. Not in work only but in aim, in control of appetite, in fostering of pure affection, in obedience to the ought of conscience you are to be at your best. Was it not Charles Lamb who said that all he lacked for writing Shakespeare was a mind to? It was said by a great librarian, Mr. Coxe, of the Bodleian, "I never enter the library without looking at the portrait of Bodley, and resolving to do nothing which would have offended Sir Thomas." On the walls of your office, above the chair by the side of which you are to stand for days and

years, hang a picture of the highest, holiest known to you. Let it inspire you never to do a thing of which that highest and holiest would disapprove. Your best may be exceedingly good or your best may not be so excellent as another man's hand. Nevertheless you are to remember that obligation and ability are like action and reaction in physics, always opposite and equal. You are to oblige yourself to do all that your ability fits you to do, and you are to feel yourself able to do all that in any way you feel yourself obliged to do. To do and to be your best, that is a second element in professional triumph.

A third condition emerges out of the study of these human lives. It is this—they were human lives. I do not say this as an apology; I say this rather as a very high encomium. I notice that the men whom humanity admires are human. Humanity likes to make its heroes by the divine method of creation, in its own image. The men whose names live as rallying cries are very human men. The humanity may emerge in an intense sympathy with the religious problems of the time, as in Tennyson. The humanity may emerge in the ethical problems of the time, as in Browning. The humanity may emerge in a large fellowship with the higher and sincerer forms of the intellectual life of the age, as in Lowell. The humanity may emerge in a deep feeling with the common difficulties of our common life, as in Whittier. But no matter in what point of application humanity meets humanity, it is still true that humanity must meet humanity. The lives which are human are the lives which live with men in the deathless centuries. My message, therefore, to you is a message to put yourself into all the relations of humanity. Life is measured by the variety and intensity of its relationships. Live a life varied and intense. Let it be a life vital and virile. Let all that interests humanity interest you. The hopes and the fears, the struggles that have their own reward and the struggles that result in the fruitage of purposes—they are all a part of your being. Be a pessimist if you must be. Believe that "right is forever on the scaffold and wrong forever on the throne." Be a meliorist, if that seems better; believe that things, on the whole, tend towards goodness. Be an optimist if you can be; "believe that God standeth within the shadow, keeping watch above his own." But at all events, do believe in humanity, and so believe in humanity as to be yourself largely, magnificently

human. You were a man before you were a dentist. Be a man, large, strong, noble, while you are one.

There is a fourth side of my four-square thought which I would present. Those men of whom I read believed in the divine essence and relation of life. This address is not a sermon, but every address, on an occasion like the present, must have elements of a sermon. It must touch on the great themes and on the great principles. The great themes are religious. The great pictures of the world's art are religious. The great poems are religious poems. The great works of architects were built for religious purposes. You are to be men of sober minds, and sober-mindedness leads to relations in thought and feeling with Him who is called God. You are to be men of high purpose, and high purpose speaks to the attentive soul that "every man's life is a plan of God." You are to be men of comprehensive vision, but wide knowledge is not complete unless the spirit of man is touched by the spirit of omniscience. You are to relate your science with his omniscience, your potencies with his omnipotence. It is not for me now and here to interpret for you the significance of this omniscience and omnipotence. But I can say in all fitness, make the essence and relations of life as divine and as personal as your reason allows. Adopt, if you will, the thought of Herbert Spencer, who says: "Amid the mysteries, which become the more mysterious the more they are thought about, there will remain the one absolute certainty, that man is ever in the presence of an Infinite and Eternal Energy, from which all things proceed." Think, if you will, of the divine essence as an "infinite and eternal energy," but in this thought believe, in this thought live. Think of the divine essence, if you can, as a father, as a friend, as a personal lover, but at all events make this thought a belief, make this thought a principle, make this thought a rule of conduct. Feel that your life as a result has relations with the great First Cause, and feel also that your life as a cause is a part of the Universal Life, which controls all but is controlled by none. Let your life be divine in purpose and ministry, in essence and relation.

These, then, are some of thoughts which I gather up as I read the lives of good men, whether they be twelve or twelve hundred; they lived under the best associations which they could find; they did the best which they could do; they were human,

and they believed in the divine essence and relations of being. These are the words, therefore, that I as President of the University of which you have been students, and of whom you are soon to become the adopted sons, words which I speak to you at this formal adoption of yourselves into this goodly fellowship.

You are going forth to live your appointed lives, to do your prescribed work. I am sure that you desire the verdict of the world in your favor. A great American said some time ago that "it is only for the sake of those who believed in us early that we desire the verdict of the world in our favor. It is the natural point of honor to hold our endorsers harmless." For the sake of us who have been your teachers and whose signs of approval you are soon to receive you do desire to win your purpose. But for the sake of yourselves, for the sake of humanity, we, your teachers, wish you to succeed. Your profession has relations with human life. It opens to you the best associations. It urges you to do your best and to be your best. It has relations with the divine. Your profession is simply another name for opportunity. Speed your feet along your appointed ways.

ALL SORTS.

To Hold Rubber Tubing and Ligatures in Place.—If you wish rubber tubing to remain on a tooth without slipping, let some sticky cement dry on the tooth before adjusting the tubing. To hold ligatures, dry, and cover them with sticky cement.—*C. H. Thorn, Items.*

Nitrate of Silver in Diseased Antrum.—Recently we have used one to two per cent. of nitrate of silver in water to arrest chronic discharge from the antrum—with success. In one case of two years' standing, washing the cavity twice daily for three weeks, caused the discharge to cease.—*Dental Digest.*

Neuralgia of the Trifacial.—According to Leibrich (*Journal de Medicene*), butyl-chloral possesses, in addition to its saporific properties, a truly specific action on the trifacial nerve; anesthesia is produced along the whole of its course after the administration of from fifteen to forty grains of this drug.—*Med. Age.* *

Band Material.—A nickel rolled out thin for bands, etc., is superior to the German silver band material that we buy in depots. It is tougher, has better color, to me more easily soldered, and will yield

more than twice as much band material as we find in the Angle coil, which costs fifty cents.—*B. D. Brabeon, Items.*

Test for Tincture of Iodine.—The chief requirement in this is the proper amount of free iodine, which should be 11 grains in the fluid ounce. Consequently not less than 21 nor more than 22 grains of pure crystallized hypo-sulphite of soda should be required for decolorization of the blue color produced on adding a little starch water to the ounce of tincture.—*Amer. Druggist.*

To Prepare Sheet Wax for Use in Cold Weather.—Dr. F. Messerechmitt has the following in the *Southern Dental Journal*: “When making sheet wax in cold weather, add a small amount of Venice turpentine, it will be more pliable and less liable to break. Hard wax for crown and bridge-work, etc., is easily made by using gum, demar and wax; melting the demar first, then adding the wax, you can obtain the wax as hard as you wish. Use carmine for coloring sandarac varnish for coating impressions.”

Ice-Chloroform.—J. Christian Bay, F.G.B.S., Bacteriologist to the Iowa State Board of Health, is pursuing investigations into the mor-tiferous poisons of chloroform, and asks that samples of long-preserved chloroform and other fluid chemicals containing whitish flocks or precipitates be sent to him for examination. He claims to have found in chloroform which had caused death, certain chemical products of the putrefaction of the anesthetic. Following in this line the investigations of Dr. René Du Bois-Reymond, Mr. Bay says that these poisonous products may be removed by crystallization in ice, and that such ice-chloroform presents the only security against danger from a long kept specimen.

To Clean and Polish Aluminum.—Sheets of this metal are rendered beautifully white by dipping them first into a strong solution of caustic potash and afterwards into benzine; the latter removes all dirt and grease. When thus cleansed, they are plunged into a bath of 2 parts of nitric acid to 1 of water, next into strong nitric acid alone, and finally into a mixture of equal parts of vinegar and water. They are then carefully washed in pure water, and thoroughly dried in hot saw-dust. A very brilliant luster may be imparted to objects of aluminum, with much rubbing, by immersing them in an emulsion produced by shaking together equal parts of olive oil and rum.—*The Busy Dentist.*

A New Method of Narcosis.—At a meeting of the Berlin Medical Society, November 28, 1894, Dr. P. Rosenberg described a new method of combined anesthesia which he trusted would entirely prevent the lethal action of the chloroform on the heart. He has demonstrated

by experiments on animals that cardiac syncope during chloroform narcosis is due to reflex irritation originating in the nasal mucous membrane and transmitted to nerves having a paralyzant action upon the heart and respiration. By anesthetizing the mucous membrane of the nose with a spray of cocaine these reflex disturbances are prevented, and, in view of the fact that cocaine is an antidote to chloroform, its absorption will in another way obviate the injurious effects of the latter.

Dangers of Cocaine.—Dr. A. R. Baker, of Cleveland, Ohio, in a paper published in the *American Journal of Ophthalmology*, recapitulates the dangers of cocaine in a collection of ten fatal cases of poisoning by the drug. The smallest fatal dose where a measured quantity was given was two-thirds of a grain, which was injected into an eye, with the result that immediate unconsciousness was produced, followed by death in four hours. One grain injected into the gums by a dentist produced death in a few minutes. The application of a ten per cent. solution to the larynx with a brush was also fatal, unconsciousness following almost at once and death in three hours. The author also reports a case where the instillation of a six per cent. solution was followed by alarming depression, with periods of unconsciousness attended with delirium.

Dental Dots.—The following are taken from an article in the *Dominion Dental Journal*, by Dr. D. V. Beacock :

“ *Copper amalgam* is sometimes useful for repairing rubber plates, replacing a block or broken tooth without vulcanizing.

To make *copper amalgam* antiseptic, add a few drops of muriatic acid, diluted with water. This has considerable affinity for both copper and mercury. It will hasten the amalgamation, the chlorine uniting to form bichloride of mercury. Wash well with salt and water. NOTE.—The diluted acid can be kept in a bottle, and be always ready for use; the salt and water in a separate bottle. Both should be labelled, and a niche cut in the side of each cork.

Keep your *gutta-percha* under salt water and it will keep good for years.

Lacto-peptine will digest small portions of pulp-tissue that may be left in a root.”

Repair of Bridge-Work.—A simple method of restoring the porcelain facing broken away from a piece of bridge-work is as follows; We take, for illustration, a central incisor. Make a perpendicular slot in the backing, of a width slightly exceeding the distance between the outer edges of the pins in the selected tooth. The depth must be proportioned to the thickness of the gold at this point, care being taken not to endanger the strength of the piece. Undercut on both sides. Fit accurately

to this slot a beveled slide of 18-carat gold backing. It should be exactly flush, no more. After grinding the tooth to gum, adjust to the backing and try in. When all is satisfactory, solder. The holes for the pins should be widely reamed (not enlarged), and but little solder used. File away surplus, and you will have a tooth which will slide exactly into position, leaving the lingual surface of the piece unaltered. A little thin phosphate will secure it. It will be more solid than a Tammany boss.—CHARLES W. JENKINS, in *Dental Cosmos*.

Wicks (V. P.) on Polishing Porcelain Teeth.—It is frequently necessary to grind a porcelain tooth, to transform a central incisor into a lateral incisor, a cuspid, or into a bicuspid. More often one is obliged to grind a tooth to get it into the space it is to fill. I have tried several methods, but none have equalled, either in efficiency or in the rapidity with which it can be done, this process: First grind and shapen the tooth on the lathe, after which it is easy to remove all the marks of the lathe wheels, and make the tooth very smooth by using an emery disk with the engine, following with a cuttle-fish disk. Then polish the tooth on the lathe with a felt wheel, using as a powder pulverized pumice stone, and you will be pleased with the splendid appearance of the tooth.

To remove the artificial glaze from a tooth, or crown, it is only necessary to use the paper disks on the engine and polish on the lathe, as before mentioned.

If care is given, the work can be done in less than five minutes, and even if the tooth be of our American make, I doubt if any experienced eye could detect the grinding, short of careful scrutiny.—*Items of Interest*.

Trigeminal Neuralgia.—A case is narrated in *The Lancet*, by Dr. Hedley, of severe paroxysmal neuralgia of the second and third divisions of the fifth nerve. The patient, a man aged fifty-three, had suffered for about four years. Galvanism and the internal administration of Indian hemp had given some relief, but, later, neither this nor other drugs were of any avail. During a paroxysm the patient made strong pressure with his thumb over the mental foramen on the left side. Examination failed to discover a dental cause, and the continuous current was then applied without success. By insulating the patient, however, and "taking sparks" from the points of greatest pain relief was obtained but only for a time. The left lower wisdom tooth was extracted at the patient's request, but half an hour later the pain returned with much increased violence. Two days afterwards the hydro-electric bath was used at a temperature of 98 deg. F. for fifteen minutes with striking results. The baths were continued daily for a week, and for the last two months the patient has been free from pain. The important questions are, How

long will the immunity last, and how far will the same procedure be successful on recurrence?—*British Dental Journal*.

A Note on Capping a Tooth Pulp.—In the February issue of the *Dental Digest*, Dr. C. R. Taylor says: "It is often troublesome to cap a pulp with oxyphosphate of zinc on account of that material sticking to the instruments used to convey it to the parts desired to be covered without spreading it over the whole of the cavity. By the use of the following method the troublesome part can be avoided.

Take a piece of clean writing paper of the proper size and on the paper place a sufficient quantity of the cement, soft or hard, as the case requires; having taken hold of the corner of paper with the pliers before the cement was placed on the paper, carry the paper and cement to the parts to be capped, pass a burnishing instrument against the paper and burnish the capping to its place. If it is desired to get the benefit of the sticking qualities of the cement to assist in holding the filling in the cavity, put cement on both sides of the paper, before placing it in place.

The same method can be used with the paper and chloro-percha.

Not only does the paper act as a convenient carrier, but it is a splendid non-conductor. Superior to almost everything used for that purpose."

Dry and Sterilize Cavities before Filling.—In the discussion of Dr. Pritchett's paper, read before the Illinois State Society, Dr. G. V. Black says: "With reference to this, I will say, I do not want to dry the cavity before I fill it, and before I finish excavating it. I do not want to sterilize the cavity, with all due deference to Dr. Pritchett and any one else who does it. In the first place, I do not want to dry the cavity before I fill it, because part of my excavating is done with the cavity dry. If I do some of it while the cavity is moist, when I finish the cavity is dry. I want to put the material against the walls of the cavity in exactly the condition they were left by my instrument. No moisture, nothing to come in contact with them after I have trimmed them, nothing to sterilize it, or anything of the kind. I want to cut until I have got strong, healthy tissue, and when I have done cutting I put the filling material against the healthy tissue just as I cut it. I believe it is the best way to do. We cannot sterilize the cavity with anything whatever and have the walls afterwards in as good condition to receive the filling as before. A tooth has a good deal of water in it, and we cannot remove much of it by any form of drying. If we do, we run great risk of serious injury to the tooth, for, as a matter of experiment, I find I cannot half-dry teeth without danger of cracking them. There is no danger in drying them with cotton. Since some experiments I

have recently made, I am compelled to feel that there is danger in drying teeth by heat.—*Trans. Ill. State Society.*

Sitherwood (G. D.) on Aluminum.—Commercial aluminum may be readily tested with a knife; if quite pure it cuts smoothly, the shavings turning up similar to pure tin, yet 95 per cent metal can hardly be cut at all, the shavings break off short and a fine grating is felt through the blade. Pure aluminum stands third in malleability, being exceeded only by gold and silver. In induction it stands seventh, gold, silver, platinum, iron, very soft steel and copper coming before it. Sheets of the metal are rolled down to 0.0007 of an inch in thickness and beaten into leaf as thin as gold leaf. Its electrical conductivity is about 55, taking that of silver at 100, but is practically nonmagnetic. Is easily and readily welded by the electric process of Dr. Thompson. The soldering process has proven more difficult, yet there are a number of solders used successfully. A very good solder is formed of 45 parts tin and 10 parts aluminum, applied with a common soldering iron, without flux or preparation of the pieces further than to have the parts to be united filed or scratched to a clean, bright surface.

In swaging use horn mallet and smooth pliers, always keeping a piece of thin tissue paper between the plate and die, also between the counterdie and plate. The tissue paper is a great protection in keeping the plate clean, as there is always danger of driving small particles of zinc or lead into the texture of the plate. It must be frequently annealed, being careful not to overheat, bearing in mind that the melting point of aluminum is about 1,150° F. If the plate is heated quite hot and dropped in cold water it becomes very soft, but at the same time will lose its elasticity, which is undesirable; it should be left to cool gradually, as when worked thus it will be elastic like coin gold. A German firm engaged in making aluminum, states that by long, gradual cooling from a red heat, aluminum can be made so elastic that it can even be used for hair springs for watches.—*Extract Dental Review.*

Salol as a Root-Canal Filling.—At a recent meeting of the Academy of Stomatology, Philadelphia, the use of salol as a root filling received favorable notice. In the report in the *International Dental Journal*, for February, Dr. Burchard says: "Since the publication of Dr. Mascort's excellent paper in the *Dental Cosmos* on "Salol as a Root-Filling," I have been using that substance almost exclusively for this purpose, and, so far as some ten months of trial can prove, with uniform success. A solution of peroxide is first used to saponify fatty material, dissolve and drive out the contents of the tubuli. This is neutralized by a weak solution of sulphuric acid followed by thorough drying with

alcohol and hot blast; then with a pair of long-pointed dressing pliers a portion of crystals is taken up and held above a flame until it becomes fluid. The closed points are then placed as high up the canal as possible, and slowly opened, the fluid runs up the dry canal. An iridium broach warmed is used to pump the salol to the apex, and in the still fluid material a point of metal or gutta-percha is thrust. This is used in the event of reopening of the tooth ever becoming advisable. By warming the point it may be withdrawn, and with it the melted salol, rendering access to the apex easy. Experimenting with teeth out of the mouth has demonstrated some difficulty in removal where a central mass of other material has not been used."

Dr. E. C. Kirk says: "I would like to bear testimony to the value of salol as a root-filling material. Since the publication of Dr. Mascort's paper and for a month previous to that, because I had the paper in my possession fully a month before it was published, I have used nothing but salol for filling roots in my practice. I have, in some cases, used it in connection with a gutta-percha point, but generally without it. It crystallizes solidly in the canal. When it is melted and introduced into the warm, dry canal, it apparently flows into the uttermost extremities of it. It has a fluid character like melted paraffin or the paraffin oils, and in a few moments it crystallizes. I have yet to have the first case of apical pericementitis follow a case so treated, although I have been almost, you might say, careless in the use of it—that is, I have used it in immediate treatment of cases and those of recent devitalization, and it has been uniformly satisfactory to me. . . . I use a Donaldson bristle to introduce the salol, first carrying the bristle to the apex of the root as nearly as I can; then with long pliers I carry the liquid up, and, having the broach in position as I introduce the salol, I slowly withdraw it so that I get the salol drawn into the space previously occupied by the instrument. There is a better chance by this method, I think, of carrying it to the apex. It can be readily pumped into a canal with a broach armed with cotton. It is a difficult matter to pump salol in a liquid form vertically into a root-canal, but it will flow by capillary attraction, which carries it upward, so that we are reasonably certain that we have filled to the apex; that, of course, we never know absolutely until such a tooth is extracted and examined."

Baumgardner (I. G.) on a System of Decayed-Root, Reinforcement for Crown- and Bridge-work.—Who of us has not been puzzled at the obstacles offered in crowning roots whose exposed surfaces have decayed, or been otherwise lost far beneath the gingival margin? The sound portion may be strongly anchored in the alveolus, and be otherwise serviceable for a good crown, but the difficulty encountered in

building it out for use always makes us uncertain as to its durability and resistance against the force to be used upon it.

Let us suppose a superior central incisor in the condition described—with the root-margins decayed completely or partially far below the gingivæ. The root is first treated antiseptically, the canal enlarged, and the apical foramen sealed. The gum is carefully pressed back with gutta-percha, exposing ragged margins, which are trimmed and beveled slightly outward, after which the gingival third of the canal is further enlarged.

A flat and narrow pin is now adapted to the side of the enlarged canal, and its free end bent outward at a right angle over the end of the root as far as the periphery. The periphery of the root is next measured with a piece of binding wire, and a band of the same size is made of thin platinum or gold which just clears the extreme bevel on the root. The band should be of such width as to extend from the surface of the root to the gingival margin, or the length of the root desired for the crown. To this band the pin is soldered and afterward securely cemented in the root-canal, care being taken to press the pin to the side of the root.

A pin in size to that of the future crown is now selected, and, after carefully reaming out the cement in the opposite side of the root, leaving it extend in the apical portion about a quarter of an inch to secure the band-pin, the pin is placed in position, and amalgam or cement is packed around it, completely filling in the space in the root and in the band flush with the gingival margin, care being taken to rotate the pin from time to time to admit of its easy withdrawal.

In manipulating the amalgam or cement, a little is placed in the pin-hole, and upon inserting the pin the excess is driven out, which gives additional attachment for that which fills the band, thus making a perfect union between band and root.

In case a fixed post is desired, this is easily attached to the band (not requiring the side pin), and cemented to place, filling the band as desired with cement or amalgam. Should it be found difficult in any case to bring the band perfectly in contact all around with the root-edge or margins, the space is easily filled up with amalgam while filling the band, and trimmed before hardening.

Roots so reinforced have practically the strength of perfect roots, and are adaptable for any system of crown or cap. The enlargement of the root-canal can generally be made in one side,—which takes little from its substance,—and the two pins insure the security of the crown.

Decayed molars and bicuspid roots I reinforce in the same way, and the system is very useful in making a quick all-metal crown,—particularly where the bite is abnormal, or so short as to make the articulation

of a cap-crown difficult. The band of gold or platinum is carefully filled and made high enough to just come in contact with the occluding teeth, after which it is soldered to one or two pins,—as there are roots,—and securely cemented to place. Amalgam is packed around the pins and in the band, and before hardening is dressed and articulated with the antagonizing teeth, making as perfect a masticating surface and as secure a crown as could be desired.—*Dental Cosmos*.

Notes on Amalgams.—Mr. C. S. Tomes read a paper on this subject before the Odontological Society of Great Britain. We abstract a portion of this article from the *Dental Record* for February: From a great number of carefully conducted experiments—which space prevents our giving in detail—Mr. Tomes arrived at the conclusion that granularity of the surface was not responsible for the leakage, and that he had to deal with a real shrinkage. He then tried lining the cavity with quite a thin layer of amalgam, filling the rest of the cavity with Harvard cement. For the first time he got an absolutely perfect result, thereby conclusively proving that the surface of the amalgam was fine enough to be water-tight, and that it was to shrinkage or change of form that its faults were due. Experimenting further in the same direction he found it possible to line the cavity thinly with amalgam, fill up the great bulk with soft Harvard cement, and coat the free surface with amalgam. This gave a very good result. He had been asked, why line the cavity with amalgam at all? His idea was that the fluids of the mouth should at no point whatever get access, even in ever so small a degree, to the cement, which they would do if the cement cropped out anywhere. On the other hand he was anxious that the thin layer of amalgam against the edges should everywhere be held up to its place by the setting of cement, and not of a mass of amalgam, which would be likely to shrink and alter a little in form. A series of experiments were then made as to the possibility of embedding something in the amalgam which would prevent shrinkage, or compel it in some other direction. Rings of dental alloy, steel, and pieces of porcelain tooth were embedded in amalgam, but perfect results were not obtained. Then a number of experiments were tried with amalgam that had been used, that is, that had been once set, and had done their shrinkage. These experiments gave perfect results, but the rapidity of the setting was a great obstacle to its use in difficult cases. He found that if the cavity was filled so as to cover up the edges with amalgam it was possible to go on contouring with freshly mixed amalgam without interfering with its water-tight edges, and so the question seemed to be to some extent solved. It next occurred to him that possibly some freshly mixed amalgam might be added to the old heated amalgam without altogether losing the advantages which the latter seemed to offer. A

variety of experiments led to the conclusion that equal parts of old heated amalgam and freshly mixed amalgam thoroughly incorporated with each other produced a water-tight filling without shrinkage. Throughout the paper he had used the term shrinkage as covering also change of form. He had not gone into much detail as to the actual experiments, but had given the results rather than the means by which he had been led to them, which would only be wearisome. As practical hints in using amalgam, he might mention that he had found in large cavities the support of a matrix invaluable. The easiest method of manipulation was to rapidly burnish a small quantity against the walls, then to take a large piece which would fill up the bulk of the cavity, and finish by the addition of small pieces. If during the accomplishment of this the amalgam had set, heat the final portion just as though the whole filling were being made with old amalgam, and use hot instruments. If the operator desired to use old amalgam for the whole portion, the best plan was to heat the whole amalgam in a spirit or Bunsen gas flame, and then lay it on a hot plate over the flame so as to keep it soft. As good results were only obtainable with rapidity of setting, it was necessary to dry the cavity and protect it from moisture before mixing up or heating the amalgam mass.

Two Simple Methods of Treatment of Fractures of the Lower Jaw.—In an article read before the Wisconsin State Society and published in the January *Dental Review*, Dr. T. L. Gilmer says :

“There is perhaps no branch of our specialty to which the dentist gives less attention than to the treatment of fractures of the jaws. . . .

“It is not my intention to go over the whole subject, but merely to give two simple methods by which a majority of fractures of the lower jaw may be successfully treated. The methods given have been used many times in my practice, and very rarely have I had recourse to the older methods in the treatment of fractured jaws in the last ten years.

“The simplest method is as follows : Suppose a case, such as I recently had—an elevator boy arriving half an hour before time to go on duty, amused himself by a ball secured to a string which from the stairway he threw up the shaft, leaning over the iron railing. He did not notice the rapid descent of the elevator and was caught between the railing and the bottom of the elevator car which resulted in a fracture of the lower jaw at each angle, also on a line with the second bicuspid tooth on the left side, the latter being compound and comminuted.

“By the force which caused the injury, and by muscular contractions, there was much displacement of the fragments. The mouth, including the teeth was cleansed as thoroughly as possible with a tooth-

brush, and the parts disinfected with hydrozone (3 per cent. solution) and oil of cassia in water. Then about the cervical portion of a number of teeth on each jaw, anterior and posterior to the compound fracture, was placed soft iron wires of sufficient length. These wires were tightly twisted to fit the teeth closely. The teeth of the fragments were brought into articulation with the teeth of the upper jaw, and the wires of the lower secured to those of the upper teeth, bringing the lower jaw firmly to the upper. To overcome the pull on the teeth by muscular strain, the bandage was applied loosely for twenty-four hours, when it was removed, as by this time muscular contraction was so far overcome as to render the bandage useless.

"It is rarely the case that a mouth can be found, especially if there be a fracture of the jaw, in which no teeth have been lost. If all the teeth were in place and sound, and there was no opportunity to feed the patient through spaces between the teeth or by a small curved point syringe at the rear of the teeth, I would not hesitate to extract a bicuspid or molar for this purpose. Usually one tooth is loosened on the line of fracture; this may be sacrificed.

"An excellent syringe for feeding the patient is that employed by the surgeon as a powder blower, but any bulb syringe with a sufficiently large nozzle may be used. The only objection to this method of treatment is the danger of choking in case of vomiting, but after the stomach has digested the food it contains, the danger is slight, and this same objection would apply to other methods when the lower is secured to the upper jaw.

"The other method of treatment is by splint. An impression is taken of the teeth of both jaws. If the fragments of the lower jaw are out of place no attempt is made to hold them in place if they are displaced readily by muscular action. Casts are now made from the impression, and if the lower alignment of the teeth does not permit exact original articulation with the teeth of the upper cast, the lower is sawed in two on the line of fracture and the cast reconstructed by articulating the occlusal surfaces of the teeth of the upper cast. The two pieces of the lower cast are now secured to each other by the application of a little plaster. The teeth of the cast of the lower jaw are reproduced in Mello's metal and on these is swaged a plate of German silver, silver or gold. This plate should extend down to cover at least two-thirds of the length of the teeth. Its length should be sufficient to cover several teeth anterior and posterior to the fracture. This splint should be cemented to the teeth with phosphate of zinc. This method is cleanly, easily made, and permits the mouth, if there be no other injuries of the bone, to be opened and closed at will."

Wasson (L. C.) on the Use of Arsenic as an Obtundent of Sensitive Dentine.—Much has been written and said of late on the subject of painless dentistry; in fact, painless dentistry has become a fad with the American people, and the dentist who does not perform painless operations is regarded by a large per centage of his patrons as unskillful and behind the times. The busy man has the question asked him every day, "Doctor, can you fill my teeth without hurting?" If he answers in the negative, he is conscious that he has fallen in the estimation of the patient. I recently read an article from the pen of Dr. W. H. Trueman in the *Office and Laboratory* on the subject "Should Arsenic Ever be Used as an Obtundent?" In the article referred to, the doctor mildly disapproves of its use, but at the same time reports a number of cases where it was used with apparent benefit to the patient and no unfavorable results, thereby leaving the impression that the use of arsenic is permissible under certain circumstances. That the doctor intended to discourage its use, I have no doubt, but his article is misleading and will undoubtedly have a tendency to tempt younger members of the profession into a very dangerous practice, and will also furnish the unprincipled scamp with a reasonable excuse for using arsenic in his so-called painless dental operations.

I recently had an experience with a patient from one of these painless shops that I shall not forget soon. On February 24th, a young married lady, a teacher in a neighboring State, was brought to me for treatment, and I can truly say that in the thirty years that I have practiced dentistry I have never seen a more pitiable case. The history of the case, as I then learned it, was as follows: A few months previous the lady had occasion to go to a dentist to have some teeth filled. The teeth were very sensitive and the doctor told her he could use a preparation that would entirely relieve her while preparing the cavities. This was, of course, what she wanted, and she readily consented to its use, not dreaming of any danger. The doctor made his application in several of her teeth and directed her to call again the next day, which she did, and had several of them filled without any of the tortures of the previous day. Believing that she had found a truly scientific man in the person of her dentist, she sounded his praises wherever opportunity offered. A month later some of her teeth began to get sore, and one after another abscessed, until life became a burden to her. She had some of them opened and treated and one of them extracted, but with little or no benefit. Her suffering steadily increased, until she was compelled to give up her situation and go in search of relief.

On the advice of friends, she went to Chicago and consulted an eminent member of the profession, who advised her that the superior

teeth must all be removed and a portion of the superior maxillary bone. This so alarmed her that she returned home without having anything done. Her condition steadily grew worse. The pains, which had heretofore been confined to the teeth and alveolus, suddenly became periodical and greatly intensified, and were seemingly located in the frontal sinus. These periodical attacks came on several times during the twenty-four hours and often lasted for an hour or more, during which her suffering was beyond description. Nothing seemed to afford her any relief, not even hypodermic injections. Under this agonizing strain her nervous system broke down completely and she became almost a mental as well as a physical wreck.

About this time her brother, who resides in the city, brought her here in the hope that something might be done for her relief. On Feb. 24th I saw the case with her physician and made a careful examination. I found the teeth from the second molar on the right side to the first molar on the left side apparently dead and most of them loose; the alveolar process badly necrosed and several pieces loose, but could not detect any disease of the maxillary bone, except the palatal portion on the right side. Pus was oozing from the gum from many places, and altogether it presented as sickening an appearance as any case I can remember to have seen. The periodical character of the pains made me suspicious that there was a disease of the antrum in connection with the other trouble, but the absence of any unusual discharge through the nares or any displacement of the bones of the face seemed to indicate that the antrum was not involved. After consultation with the physician in attendance, I recommended the immediate removal of the affected teeth and all detached pieces of the alveolus. As this seemed to offer the only hope of relief, she finally consented to have it done, and on the following day I removed the teeth and all loose portions of the alveolus. When the teeth on the right side came away, my suspicions as the condition of the antrum were quickly confirmed, for a quantity of pus of such a character as is never found elsewhere quickly followed their removal, showing that the roots of some of the teeth must have entered the cavity of the antrum. Upon examination, I found this to be true. Both the palatal roots of the first and second molar pierced its floor. I enlarged the openings into the antrum, so that I could thoroughly cleanse it, after which I made a careful examination, but found no diseased or necrosed bone within the walls of the cavity. I applied the usual remedies and cleansed daily with water as warm as the patient could bear. After removing the loose or detached pieces of the alveolus and cleansing with warm water, I applied daily, to all the exposed surfaces of the bone, a fifty per cent solution of hydrochloric acid, which resulted in the exfoliation of numerous pieces of

carious bone. The physician in charge of her general health prescribed tonics and a generous diet. At the end of two weeks her condition was greatly improved, and the pains had almost entirely disappeared. A month later the case was discharged apparently well, and has continued in that condition up to the present time.

This is a case where the use of arsenic as an obtundent was not permissible, but I fancy some gentleman will take the floor as soon as there is an opportunity and say this is an unusual case; that arsenic does not always produce such results. That I concede is true, but who among us is competent to judge which of our patients have those idiosyncrasies, and who have not? All will agree that some are more susceptible to the influence of the drug than others, and if but one case in a hundred be sound, or in five hundred, is not that enough to condemn the use of arsenic for such purposes.—*Western Dental Journal*.

SOCIETIES.

THE HORACE WELLS PERMANENT MEMORIAL,

UNDER THE AUSPICES OF THE AMERICAN DENTAL ASSOCIATION.

To the Dental Profession of America:

THE Central Executive Committee appointed by the president of the American Dental Association is as follows: Dr. James Truman, Dr. Wilbur F. Litch, Dr. S. H. Guilford, Dr. E. C. Kirk, Dr. J. D. Thomas, chairman and treasurer.

This committee has been completed in its organization by including in its membership the presidents of all dental societies throughout the United States.

It is hoped to secure enough money to erect a bronze statue of Horace Wells in the national capital. The details as to the style and character of the statue, as well as its definite location, will be decided upon at the next meeting of the American Dental Association, to be held at Asbury Park, N. J.

The committee takes pleasure in calling your attention to this opportunity for doing an act of justice to the memory of a worthy member of our profession, whose discovery has been of such incalculable benefit to humanity, and which has been so great an honor to our profession. You are invited to contribute whatever amount of money you may feel able and willing to

donate to the fund, and to use your influence toward bringing our plan to a successful issue in a manner befitting the object.

Contributions may be sent by any member of the profession through the president of his local society, or direct to the treasurer, Dr. J. D. Thomas, 912 Walnut street, Philadelphia. An official receipt will be issued by the treasurer for all contributions. The full list of contributors will be embodied in the pedestal of the memorial.

J. D. THOMAS,

Chairman of the Central Executive Committee.

MISSISSIPPI VALLEY DENTAL ASSOCIATION.

THE fiftieth annual meeting of the Mississippi Valley Dental Association will be held in Cincinnati, April, 17 and 18, 1895.

J. R. CALLAHAN, *Chairman Ex. Com.*, DR. J. TAFT, *Pres.*
97 W. 8th St., Cincinnati.

ILLINOIS STATE DENTAL SOCIETY.

THE thirty-first annual meeting of the Illinois State Dental Society will be held at Galesburg, May 14 to 17, inclusive. An interesting programme is in course of preparation. All dentists practicing in Illinois are especially invited to attend. A cordial invitation is extended to the profession generally. This will be the first meeting in Galesburg since 1876, and it is the hope of the officers that it will be one of the most profitable meetings in the history of the Society.

LOUIS OTTOFY, *Secretary*,
Masonic Temple, Chicago.

CONSOLIDATION PROPOSED.

THE advisability of consolidating the Connecticut Valley and New England Dental Societies is being considered. If the consolidation be effected it promises to make a notable organization.

COMMENCEMENT.

THE commencement of the Dental College, Western Reserve University, Cleveland, O., was held on the evening of March 5,

1895. The graduates were as follows: F. Acker, L. L. Bleasdale, A. P. Buchtel, J. H. Burrows, J. W. Glas, G. A. Kennedy, D. E. Mollen, P. O. Parsons, J. J. Rosensteel, W. W. Sherman, F. J. Spargur, D. R. Stevenson, R. A. Suhr, L. S. Vinez, R. D. Wallace, G. N. Wasser, H. J. Zoekler. Number of matriculates, 53; graduates, 17.

KANSAS CITY DENTAL COLLEGE COMMENCEMENT AND BANQUET.

With thanks we acknowledge receipt of an invitation and ticket for this occasion, and regret our inability to be present.

NEW PUBLICATIONS.

TRANSACTIONS OF THE WORLD'S COLUMBIAN DENTAL CONGRESS, held in Chicago, August, 1893. Two volumes, XLIV., 1,068 pages. Edited for the general Executive Committee, by A. W. Harlan, A.M., M.D., D.D.S., assisted by Louis Ottofy, D.D.S. Press of Knight, Leonard & Co. Price in paper cover, \$10.00. Can be procured from the Treasurer, Dr. John S. Marshall, 34 Washington Street, Chicago. Publication Committee, A. W. Harlan, Louis Ottofy, A. O. Hunt.

The anxiously looked for Transactions are at last published, and when we look them over and see the amount of material and numerous illustrations they contain we do not wonder that the committee have had to consume so much time in getting them ready for publication. It has certainly been a Herculean task and much credit is due the Publication Committee, Drs. Harlan, Ottofy, and A. O. Hunt.

While a great deal of the Transactions appeared in the journals, immediately after the meeting, there were many inaccuracies in the reports and some of the most worthy papers were not to be had at that time. These volumes are not only valuable for the excellent matter they contain, but as a memento of the world's greatest dental gathering as well. In way of reminder we will mention a few of the most valuable papers presented: Concerning Various Methods Advocated for Obviating the Necessity of Extracting Devitalized Tooth Pulps, by Dr. W. D. Miller;

A Contribution to the Study of the Development of Enamel, by Dr. R. R. Andrews; Some of the Forces that Influence the Form of the Jaws and Teeth during the Process of Development, by Dr. W. X. Sudduth; Among the Ancient Hawaiians, by Dr. J. M. Whitney; Some Changes that Take Place in and Around the Pulp-Canal, by Dr. D. E. Caush; Luxation, or the Immediate Method in the Treatment of Irregular Teeth, by Dr. George Cunningham; Hypnotic Suggestion as an Obtundent and Sedative, by Dr. Thomas Fillebrown; What has Dentistry to Demonstrate against the Hypothesis of Organic Evolution, by Dr. W. G. A. Bonwill; The Teeth and Hair, their Homology and Pathological Intimacy, by Dr. S. H. Guilford; Teeth of the Lower Jaw at Birth, by Dr. Frank Abbott; The Pedigree of the Central Incisor, by Dr. A. H. Thompson; Palatal Diseases as applied to Dentistry, by Vida A. Latham; Experiments with Bichlorid of Mercury, by Carrie M. Stewart; Physiological Action of Cocain, by Dr. M. G. Viau; The Surgical Engine and its Uses, by Dr. M. H. Cryer; Surgical Treatment of Palatal Defects, by Dr. T. W. Brophy; Tinfoil for Filling Teeth, by Dr. H. L. Ambler; Treatment of Root-Canals with Potassium Sodium, by Emil Schrier; Oxyphosphates, by Dr. W. B. Ames; Operative Technics, by Dr. D. M. Cattell; Method of Constructing Spring Appliances for Correcting Irregularities of the Teeth, by Dr. V. H. Jackson; Some of the Principles Governing the Development of Facial Contours in the Practice of Orthodontia, by Dr. C. S. Case; Dental Nomenclature, by Dr. G. V. Black; Prize Essay, Tooth Preservation, an Essay on Oral Hygiene, by Dr. Geo. Cunningham. The work is apparently free from typographical errors and reflects much credit on Drs. Harlan, Ottofy, and Hunt. The press work is good, but the binding—well, it might have been better.

THE CONNECTICUT QUARTERLY, published at Hartford, Conn., contains a brief history of the discovery of anesthesia by our dental friend Dr. James McManus, of Hartford. The article is well illustrated with good portraits of Drs Wells, Riggs, and Colton, as well as engravings of the memorial tablet and statue. Those of our readers who desire a picture of Dr. Wells, should secure a copy of this magazine; it costs but 15 cents. Send to the Connecticut Quarterly Co., Box 565, Hartford, Conn.

OUR AFTERMATH.

DR. OTTO ARNOLD, is President of the Euterpean Society, Columbus, O., and we notice his well known face among the members of the orchestra.

THEY COME AND GO.—The *Busy Dentist* that started our with bright prospects last April is dead. A letter from its editor states that the publication has suspended indefinitely.

A DENTAL COLLEGE IN HOLLAND.—At present Holland is without a dental school, but we read that at a meeting of the Dutch Dental Society it was resolved to form one, and a committee was appointed to make proper arrangements for its establishment.

A NEW COLLEGE BUILDING.—The Faculty of the Dental Department of the Iowa State University are happy; they have an elegant new \$25,000 college building. It was built expressly for the college and is provided with all conveniences that can be desired.

MEANING OF THE WORD GUTTA-PERCHA.—Joseph T. Wicks writes in the *India Rubber World* that "Gutta" is a Malayan word signifying tree-sap or gum, while "Percha" means tatters or rags and is applied to the broken or intersected land for which the eastern coast of Sumatra is so remarkable. From this he derives the name as meaning gum of the broken land or islands.

In the same issue another correspondent refers the word "Percha" to the tattered appearance of the gum as it appears in commerce, making the name "tattered gum."

A NEW BUILDING FOR THE DENTAL DEPARTMENT OF THE WESTERN RESERVE UNIVERSITY, CLEVELAND, O.—A new college building is now in progress of erection for the use of this institution. The building will be located only one block from the Public Square, it will have a frontage of 46 feet and depth of 107 feet. The building will be four stories high and afford ample room for all requirements. The interior arrangement will be as near perfect as can be made. The operating room and dental laboratory will be supplied with an abundance of north light which is a commendable feature. The building will be ready for occupancy next September.

WHY PEOPLE BECOME DEAF.—It has taken the medical world a great many years to discover that the loss of hearing is almost invariably caused by some disease of the throat or nose, or both. But very recent researches in these fields have demonstrated this fact beyond question, and it is now admitted by more advanced medical men that, aside from rupture of the ear drum, there is scarcely a symptom of defective hearing which is not traceable directly to the condition of the nose and throat.

In view of the new discoveries, ear specialists are finding their occupation gone, save as they make their particular branch an assistant in further investigation. It is said, as we have already pointed out, that the use of smelling-salts is one of the most prolific causes of deafness, operating by weakening the olfactory nerves, and through them the auditory system. All strong and pungent odors should be avoided as far as possible, especially those which act upon the secretory processes, and, as the popular expression goes, "make the nose run,"—*Medical Brief*.

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No. 5.

CONTRIBUTIONS.

A NEW METHOD COMPRISING A COMBINATION OF PLATE AND BRIDGE-WORK.

BY A. S. CONDIT, FINDLAY, OHIO.

THE last twenty years has witnessed many advancements in dental science, but there is still much to be attained in the profession, and it seems to me that one of the needs of the times is a better substitute for partial sets of artificial teeth. This need I claim, is fully met in my new method, which comprises a combination of plate and bridge-work. In the explanation of this "method" it cannot be expected that I will review all of the various cases in which this work can be used, but I will in a general way mention a few of the extreme cases that cannot be made useful by the means of any former method.

In the description of this method of inserting partial sets of artificial teeth, it will be necessary to speak of the present methods, more to make the features of this method understood than to criticise.

Certainly in many cases, every dentist is much puzzled to know just what course to pursue; it is difficult to decide whether he had better use the old method of plate work, bridge work, or

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plate retained by clasp. Possibly he is as much puzzled in making artificial dentures, as the operator was to save many broken down and badly decayed teeth, before the system of crowning was adopted.

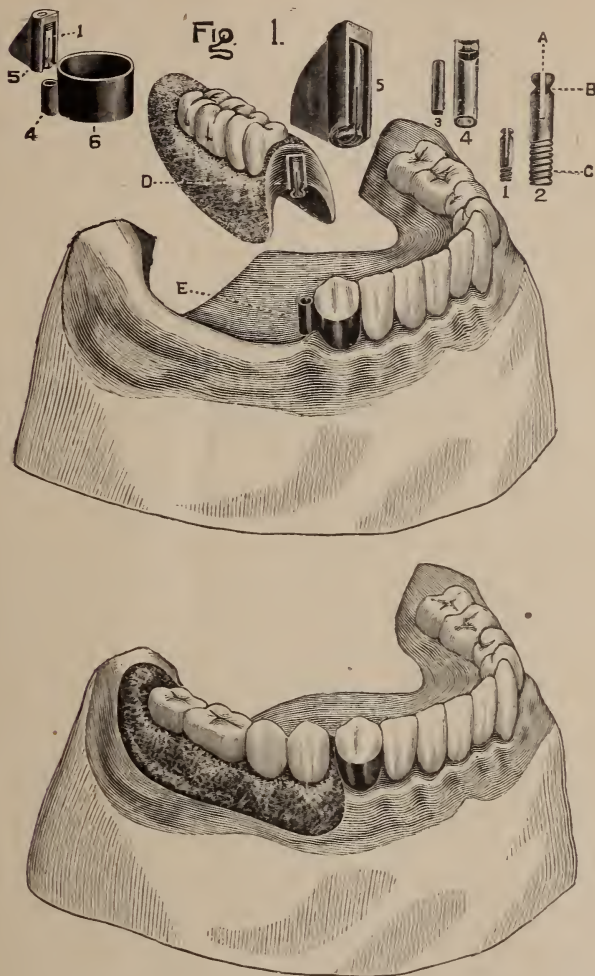
Plate work, as we all know, and especially lower partial sets as Dr. Haskell has recently said, "are the most unsuccessful dentures worn." The reasons need not be given, as every dentist already knows them too well. In the construction and adjustment of an artificial denture, the first thing to consider is its removability for cleansing and repair. The clasp method meets these two requirements fairly well, when the tooth to be clasped is of favorable shape to hold the work firmly in place; but because of the recession of the gums and the wasting away of the tooth structure, by the accumulation of fermentable material and the secretions in the mouth, the clasped tooth soon loses its efficiency and the work is a failure; a failure which is repeated when the clasp is carried to another tooth. When the tooth to be clasped is not of favorable shape to hold the work firmly in place because of its sloping sides, which is especially true of the incisors and cuspids, the work must necessarily be a failure.

How confident the amateur bridge workman now is of being able to give complete satisfaction with bridge-work in places where plate work has been a failure, his confidence remains unshaken until, to his disappointment, his work begins to return for repair. All will agree that in some cases of partial sets of teeth, bridge-work has advantages over any or all other methods of work. It must be conceded that so long as all goes well the security and permanence of the denture enhances its practical value to the patient, but if for any cause it be necessary to remove the work to repair a broken tooth, or to treat the root of one or more of the anchorage teeth, or if the attachment of one or more of the anchorage teeth become loosened then the fixedness of the bridge becomes a serious objection.

How well do bridge workmen know the difficulties incurred in preparing a case for a piece of bridge work when the teeth on each side of the case converge or diverge? My object in devising the new method was to avoid the above mentioned difficulties. It is sometimes almost necessary to expose the pulp, to make the sides parallel. By the new method it is only necessary to dress the tooth until the band or crown can be nicely adjusted, the

same as would be done to nicely cap the tooth for its preservation.

The attachment tubes or sockets are placed upon the bands



In Fig. 1 of the above illustration is represented the device in sections, viz :

1 represents the exact size of split pin.

2, the same magnified, of which A represents the split.

B, the annular groove, and C the screw.

3, the exact size of tube or socket.

4, a magnified view of same.

5, shows the different parts of device put together.

6, illustrates a band with tube 4 attached.

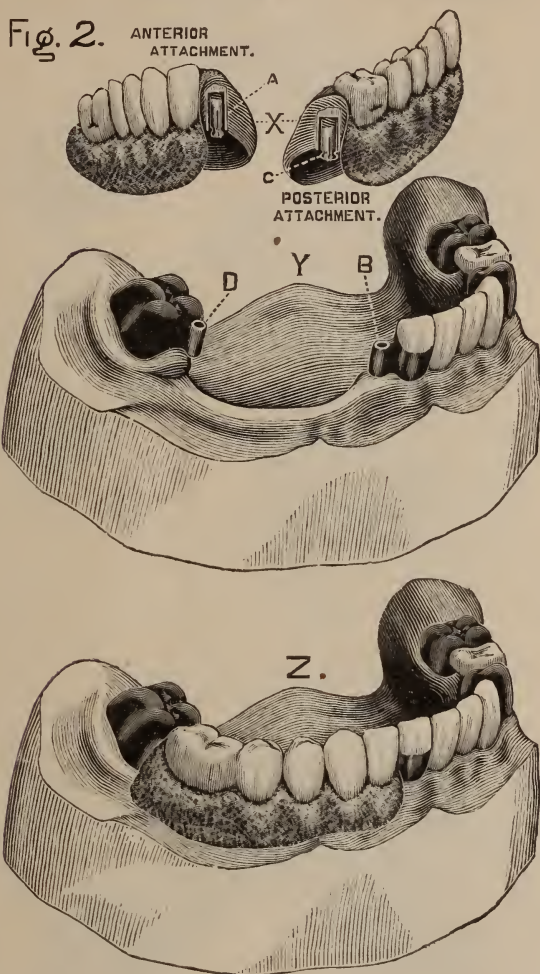
D, represents the device placed in the work and E the tube or band ready for adjustment.

or crowns parallel to each other, regardless of the position the teeth may occupy in the arch.

Fig. 1 represents a case where all the teeth, posterior to the cuspid on the right side of a lower jaw, are lost. A case which could not be retained by a clasp and the only method known to the profession is to couple the teeth on both sides with a plate permitting all the pressure of mastication to come on the gums and alveolar process, causing continued absorption and the usual tilting of one side while biting upon the opposite side. In making by the new method a band or crown is first made for the tooth adjacent to the space to be filled, then a tube or socket is made of gold or any suitable metal and soldered to the band or crown on the side next to the space on a line parallel to the lingual side of the tooth. The length of the tube is governed by the amount of space between the tooth so attached and the tooth in the opposite jaw. The longer the tube the better, yet when two attachments can be made the tube can be very short, for the solidity of the work depends almost entirely upon the lock-pin. By this method no undue pressure is placed upon the gums as the resistance in mastication is partly taken up by the tooth or teeth to which attachment is made. The tube or socket referred to, which, as previously mentioned, is soldered to the band or crown, has placed on the lower end an annular flange, making the opening at the lower end of the tube a trifle smaller than at the upper end. To this tube is fitted what is termed the cap and shield. The shield part is also a tube just large enough to fit over the one fastened to the band or crown and encircle it except at the side which is soldered. The cap covers the upper end of the large tube or shield and has a thread hole through the center into which is screwed the lock-pin. The lower end of the lock-pin is split and surrounded by an annular groove which corresponds with flange in tube upon band or crown, so that when lock-pin passes into the tube it is compressed by the flange until it reaches the groove upon the pin when the spreading out of the pin locks it firmly in place and it can not be detached except by a straight up or down pull. The cap and shield also has a projecting ear, the purpose of which is to firmly hold it to the plate.

Fig. 2 represents a case attached to central incisor and second molar on the right side of lower jaw. This is a case which would be considered impracticable for any other kind of work and right

here it might be said that it was the difficulties presented by this case of making anything satisfactory or permanent by any for-

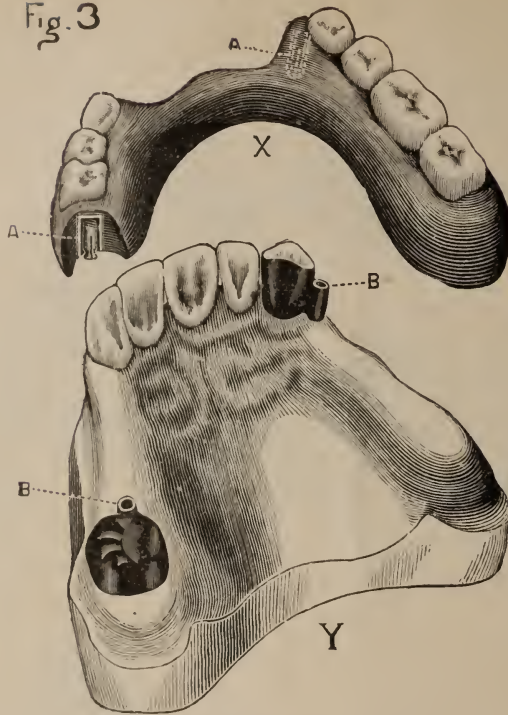


IN Figs. 2, 3 and 4 of the illustrations, X represents the work ready for adjustment. Y casts of the mouth with bands and crowns in position and tubes in proper place for the insertion of the work. Z the work in position on the cast. A represents the device as placed in the work.

B the tube placed on band, C the split pin in position in the device, and D the tube as placed on crown.

mer method, that caused the devising of "The New Method." On the left side of the jaw was a piece of bridge-work which forbade any attachment of plate to that side and it was certainly

Fig. 3



Showing mode of attachment.

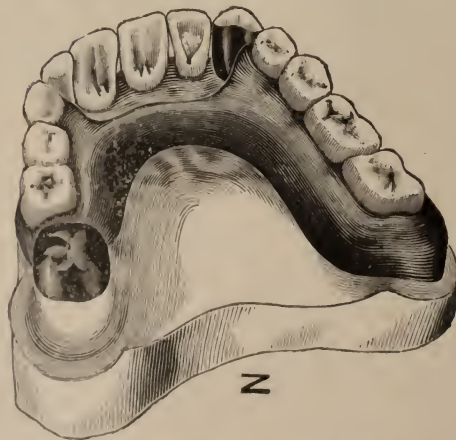
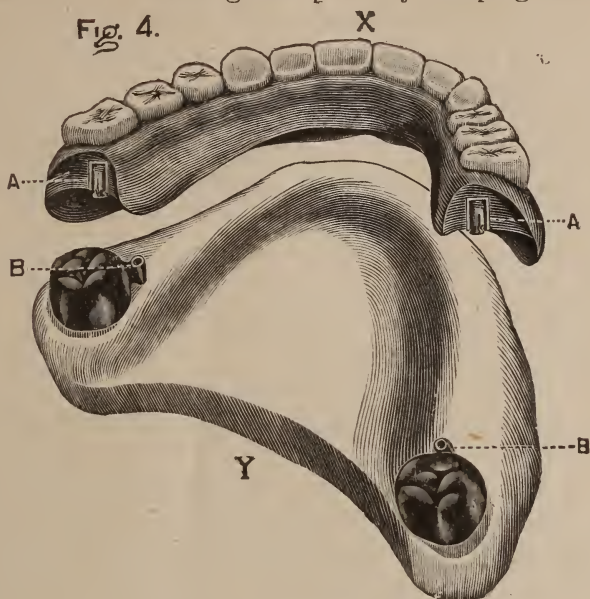


Fig. 3, Z, showing bridge-plate in position.

not advisable to use the incisor as one of the piers for a piece of bridge-work, for it would soon be moved from position and lose

its efficiency if suspended from the gum; nor was there any more encouragement of retaining the plate by clasping one or both



Showing mode of attachment.

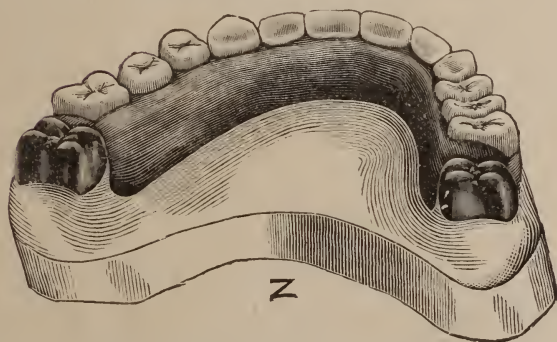


Fig. 4, Z, showing plate in position.

teeth. It was quite a puzzle to know just what was the best thing to do. It was certain if satisfaction was attained something new must be adopted and the solving of the problem brought to life "The New Method."

Fig. 3 represents the upper jaw of the case above cited. With molars and bicuspid gone on the left side, the cuspids and bicuspid gone on the right, in this case we find it necessary to

connect the teeth on both sides, that the strain occasioned by the weight on cuspid may be relieved somewhat by the molar. No one rule can be applicable in all cases, but the general principles are so familiar that they need no description and with slight modifications they may apply in most cases. In this case an attachment was made to cuspid and molar connecting the two by a narrow strip of plate, thus avoiding the covering of the entire palate and when the work was in place it was equally as strong for mastication as bridge-work could be.

Fig. 4 represents an upper case with only the second molars remaining. The attachments are sufficiently secured for comfort in masticating with but very little if any strain upon the natural teeth.

One of the strong features of this method and one that can not be attained by any other class of work in cases of absorption of the gums and alveolar process, which is not apt to occur as there is no undue pressure, is the tube and lock-pin can be shortened and the plate brought as close to the gum as desired.

In my description of this method I have tried to be as brief as possible and have not gone much into detail and thus I may not have made some important points as plain as they should be, but with this description and a careful study of the above drawings I believe that the average practitioner will readily comprehend this method and all the advantages it possesses over those now in general use.

HYPERIMIC PYORRHEA.

BY D. GENESE, BALTIMORE, MD.

IN September of '92 I was called to see a lady patient who had been under treatment of her family physician for six weeks, at the end of which time finding matters worse instead of improving, I was sent for by the mother.

I found the patient in a high nervous fever, consequent on the condition of her mouth, which previous to this ailment had been in a perfectly healthy state; always being scrupulously clean. What few teeth were filled, had gold, and for several years I had known and attended her. She had been proud of her beautiful set of teeth.

I found her mouth so completely filled with a shiny exudation from the gum margins, that both upper and lower teeth were completely hidden with it. Teeth all loose from mercurial treatment she had been subjected to.

Lifting the gum margins from the teeth, they were perfectly white and free from tartar or other irritating causes.

I put her upon fish diet with saline aperients to eliminate mercury from the system, and as a local treatment, prescribed

Tannate glycerine	-	-	-	3 ss
Boric acid	-	-	-	grs. xx
Tinct. pyrethrum	-	-	-	3 ij

A great improvement set in before a week. The medical attendant said he had never seen such a case before, but it was tedious work to get the desired result.

Inside of a month another patient, a lady friend of No. 1, presented herself for treatment, suffering with a similar ailment, only in a more aggravated form; the external tissue all peeling off, the raw surface being very painful.

Treatment same as mentioned above, with improvement, but very slow.

All the usual remedies in pyorrhea were tried, *i. e.* tannate glycerine, aromatic acid sulph., iodine and aconite, soda borate, etc. As in the first case the patient was a young lady and had beautiful teeth. There was no deposit or apparent irritating cause. A rigid investigation revealed the fact of these ladies being voluntary nurses at a child's hospital. I then suspected contamination from that source. Ordered mouth wash made from Piquett's compound antiseptic powder, teaspoonful to a pint of water, with improving results, but slow. This powder consisting of boric acid, menthol, alum, eucalyptus, thymol, hydrastis, carbolic acid, and gaultheria. Gave them as a last trial glycozone and rose water, applied every hour, on bibulous paper and a dentrifice to be used once a day of glycozone and boracic acid made into a paste.

A rapid recovery resulted. First patient had no recurrence. No. 2 had several relapses, but by applying the glycozone as above, trouble ceased and it has now entirely disappeared.

A boy 12 years old sent me by Dr. Field, similarly affected, was treated by the glycozone from the start and made a complete recovery in less than a month.

PAINLESS DENTISTRY.

BY E. H. RAFFENSPERGER, D.D.S., MARION, O.

THE cry of the times now is for painless dentistry, and the cry is a just one. Many answers have been given, and we have the heartfelt thanks of our patients. Owing to the demand many nostrums have been placed on the market, good, bad and indifferent; but many of them simply worthless, and even dangerous, gotten up by ignorant men who never heard of a *materia medica*, but nevertheless are getting rich selling for large prices that which cost only a few cents at the most.

Much harm is being done. Millions of teeth are being extracted which ought to be saved, and would be were it not for the painless craze. And to make matters still worse, the inventors of these different systems are going over the land extracting teeth by the wholesale, and selling office rights, so now there is hardly a town but has its "painless parlors," which can very truly be likened to the biblical description of hades—"where there is weeping and wailing and smashing (?) of teeth."

We, as dentists, hail with joy the advent of any new drug, appliance or method that will assist us in our profession, but we should not take up with anything we do not fully understand. The use of a good obtundant, in the hands of an honest dentist, is a boon to mankind, but my "kick" is at the abuse of them by unprincipled men, and that dentists will allow themselves to be taken in by such.

My attention has frequently been called lately to the numerous circulars sent out to the dental profession all over the land, containing glowing accounts of various nostrums to be used for the painless (?) extraction of teeth, also offering, as an extra inducement, prizes of different articles to all purchasers of the stuff. The most unique of all lies before me. It is sent out by an "association," and each purchaser of their "system" is given a "certificate of membership," neatly engraved in *Latin*, similar to the diplomas, "which (in the words of the circular) would be particularly acceptable to dentists having no diplomas, as being issued in *Latin*, is frequently mistaken for a diploma." Great

Scott! What suckers dentists must be to be fed with such bait, but no doubt many will be caught just the same.

Many dentists now-a-days devote much of their time devising some way to humbug their brother dentists by selling them some fool stuff, or office right for some new-fangled idea or method, at an absurdly high price.

Many of us remember the little Jew who visited nearly every dentist in the land, a few years ago, selling a formula for a mixture to be used in the painless extraction of teeth, and office right to use the same, all for the modest sum of twenty-five dollars, and how many dentists wanted to hire some one to kick themselves after they had paid their money, and found the formula to consist of water and a little carbolic acid. I heard of several instances where dentists had given a mortgage on their property to procure a county right.

Yea, verily, the fool killer is not attending to his duty; but so long as the dental profession will allow itself to be imposed upon by these sharks, it is bound to suffer.

We have all had some experience with the "painless tooth puller." Some of him has visited every town. He generally flourishes as a green bay tree, and lives on the fat of the land and distinguishes himself with the title of "Professor," or "King of the forceps," or some other high-flown appellation. One particular case interested me. A broken-down preacher who was fired out of his church by an indignant congregation for being a little too much interested in the welfare of some of the female portion of his flock, after living by his wits for several months, became acquainted with one of those extracting fiends, who gave the ex-parson such glowing account of how easy it was to become rich, that he concluded to start out on his own hook. He procured a few pairs of old rusty forceps and a hypodermic syringe, also a sample of the wonderful preparation. He first practiced on the jaws of a dead sheep, and with these qualifications, together with a strong muscular arm, he began a house-to-house canvass, going all over the county, but later making "date" at different towns. He got many victims, and is now doing a land office business. This is no story, but an actual fact.

The question is, why will people flock to these scamps, and pass right by a regular dental office, and place themselves in the hands of some scalawag they never heard of, who is here to-day

and to-morrow the Lord only knows where, and allow him to inject some villainous compound into their systems? But they do it just the same. Surely Barnum was not far wrong when he said the "American people were born to be humbugged." Nothing short of a law that will make tooth extracting a criminal offense, with the death penalty attached, will ever help matters any. We, as dentists, will have to preach the salvation of teeth, as we have never done before, for, at the rate teeth are going now it will only be a short time until the American people are toothless.

Our dental journals could start a reform movement that would be endorsed by the dentists all over the land, by refusing to advertise these secret nostrums. How an educated dentist can ever use in his practice any compound of which he does not know each and every ingredient, is more than I can see, and any one who will inject into a person's gums something he is not fully acquainted with, is little better than a criminal. The question is frequently asked, why these preparations are not used by the more intelligent dentists, and it is a fact they are not. It is simply because "fools rush in where angels fear to tread."

CEMENT THE IDEAL FILLING.*

BY F. E. BATTERSHELL, D.D.S., NEW PHILADELPHIA, O.

THE ideal filling should approximate perfection as a substitute for tooth-bone. It must not only bear the exterior resemblance of color, it must harmonize with the functions of the interior structure in an irritated as well as a normal condition. Its finished surface should possess the flinty hardness and strength of enamel, and afford effectual resistance to the dissolving or corroding constituents of normal or vitiated saliva. Mechanically it should plug and hermetically seal the excavated cavity, and restore the broken contour. In addition to these qualities which render this filling—this bone-graft—sightly and tolerable, it ought to contain a therapeutical agent which would render inert the destructive process of decay. The substance which will yield all the qualities as above outlined is the one which will supplant all other filling materials.

*Read before the Tuscarawas Valley Dental Society, January, 1895.

Now we wish to postulate that the oxyphosphate of zinc is the agent sought to fulfill the prophecies. To determine the correctness of this assumption, we will notice the qualities and behavior of this material which may render it worthy of such a consideration.

Color. This bone-graft, exposed on the most conspicuous as well as the remote surfaces of the teeth should be a substance whose color can be *made* to change and harmonize with the ever varying shades from blue-black or saffron to translucent whiteness. Withal the color were not a perfect copy unless an ivory luster can be imparted to agree with the brilliant enamel. With blue or yellow powder, mixed with white, the color is formed, with the ivory burnisher the luster is given, then with quiet cement we speedily pass brazen gold, blacking silver, copper, mercury, tin, and arrive at the next item.

Compatibility. An expansile or contractile material, like some of the amalgams, displays a lack of affinity to the degree of shrinkage or bulging. After the union of the phosphoric acid and the oxide, the cement thus formed remains unchanged in form and volume. The chemical processes by which the cements and amalgams are formed are essentially different. The oxide, reduced by intense heat, joins with the acid in a simple, close, and perfect union; but in amalgam the complex metals, and the unstable mercury, form a substance which is changeable and uncertain.

Non-conductor. As a thermal conductor oxyphosphate is inferior to a plug which might be made from a piece of the enamel—dentine of an extracted tooth. A carious tooth, however, that will not tolerate a cement filling should, like a sound tooth, with an inflamed pulp, be left open for treatment.

Adhesion. The various commercial cements are ranked with glue for adhesion. The acid cements more than equal the hydrated cements for viscosity. In this very desirable quality the oxyphosphate of zinc is perfect. After the decay is removed little or no cutting is necessary to secure the plug. Then it is so easily manipulated, that a high degree of perfection may, with skill and experience, be obtained.

Strength and Permanence. Cement is not so hard as gold or amalgam; but such is its cohesion and equal adhesion to all points of the cavity, that it is seldom found broken; thus offering

about the same resistance to mechanical force as other materials. In most mouths a slow wasting from the surface takes place. This abrasion is chemico-mechanical, varying with the chemical constituents of the saliva, and the individual peculiarities of mastication. However, in but few cases does the disintegration demand attention in less than a year to five or more years; and in many, the fillings remain permanent. The average we think will compare favorably with tin, amalgam, or gold, bearing in mind that these materials owe their endurance to mechanical retention in manipulation and shape of cavity.

Therapeutics. Because of the strong affinity of the oxide for hydrogen, the aqueous disintegration of the structure, subjacent to the line of decay is arrested by the dehydrating of the dentinal tubuli from without, and by the consequential resorption from within. The compound itself, like the *chloride* of zinc, is a powerful germicide. A cavity placed under the influence of this substance for two or three days, on the removal of the filling, will be found thoroughly disinfected, and *less than normally sensitive*. It is the surest disinfectant, and safest obtundent. Therefore, before filling any carious cavity, (except the smallest, which may be enlarged into the sound structure), it should first be filled with cement. No inert mechanical plug will avail to save, unless the tooth be first healed of the disease. Having, at present, more medicinal, preservative, and pleasant qualities than any other material in use, with but slight improvement, cement is the perfect filling of the future.

THE USE OF THE TURNING LATHE IN THE DENTAL LABORATORY.*

BY G. W. WOODBORNE, URICHSVILLE, O.

THE turning lathe is as useful in the dental laboratory, as the vise and anvil, if not more so. First of all, it is of great utility in the repair of instruments and tools, which can be repaired and in use by the time that you could have them ready to send away.

Secondly, you can make many things that will suit you better than those you can buy. It gives you a chance to put some of

your (original) ideas into practice, as well as those that are suggested by others.

The kind of lathe depends on circumstances, but like other tools, the better and larger range of work that can be done, the better are the results. I have a simple hand lathe without any screw cutting device. My turning tools for wood, are ordinary wood tools; for iron, brass or steel, I use gravers and three cornered files ground to proper points. I have chased screw threads by hand, but would advise all to get a geared lathe.

To particularize some, I will mention some of the many uses of the turning lathe in the dental laboratory :

When you have a broken plate to repair, you can put an inverted cone shaped bur into the chuck and drill out all of the necessary parts in less than half the time it takes to file it out. Holes can be drilled in anything. Solder can be milled off old gold plates, or out of crowns. Any piece of steel can be put in the chuck, and turned or filed down to suit you. You can make all of your polishing lathe chucks out of wood or steel, for your sand-paper, felt, corundum, in fact all of your grinding and polishing pieces, all handles, etc.

After you have been the owner of a good lathe for a short time you will think it indispensable. It will take the place of the burring engine in that class of work that takes side pressure, and is such a detriment to hand pieces. Try it.

HINTS.

BY C. J. HAND, D.D.S., ROMEO, MICH.

Forming an Air Chamber for Upper Dentures.—It is my rule to *carve* same in the impression, following the form of ridge. The pouring of the model gives the air-chamber mold in plaster; unequaled for obviating all the accidents consequent in use of lead or other metals pressed upon the model. The rubber can not flow under and prevent close adaptation of plate to the roof of mouth. A small spoon excavator run around the edge of air-chamber will give a little raised ridge on the plate that greatly facilitates a speedy suction. This style of chamber can be made very shallow, which I consider the best.

A separating medium that imparts a smooth glossy surface to

Models.—Coat impression with very thin shellac varnish, just enough to color the plaster. Then coat with a varnish made by dissolving gum sandarach 3 parts, gum elemi 1 part, in pure alcohol. Must be thin enough not to form bubbles when applied with soft brush.

FIFTY YEARS IN THE LABORATORY,
OR
THE EVOLUTION OF THE DENTAL LABORATORY AS
I HAVE SEEN IT.

BY L. P. HASKELL, CHICAGO, ILL.

WHAT I shall have to say to-day will be largely personal history, as it will relate to my personal experiences of half a century.

Were the graduate of the dental college of to-day to be placed in the dental laboratory of fifty years ago and attempt to construct a denture as then made, he would throw up his job, for such is the great advance made in tools and appliances, materials and methods, he would consider it almost impossible to construct a denture by the old methods.

In Jan., 1845, I entered upon my duties in a dental office in Boston, or rather its suburb, Chelsea. At that time, no one considered it necessary to obtain his dental education in a college; in fact the only one in existence was the Baltimore, then in its infancy, and which remained solitary and alone for many years. A large proportion of dentists picked up their dental knowledge here and there, with the doors of the operating rooms and laboratories largely closed against them; no dental journals, text books crude; no dental societies, and very little intercourse between the members of the profession.

There was, however, an absolute necessity for a knowledge of working metals, as there were no dental depots to resort to for supplies of gold and silver plate and solder, so the dentist must learn to melt gold, refine his old plates and filings, roll his plate, and make solders.

As the average dentist was not successful in saving teeth, especially if badly decayed or ulcerated, the necessity arose for cultivating skill in the construction of dentures, and as they were all of metal, it was not every one who made a success of it.

In taking impressions common beeswax was the only material used. The impression-cups were made by the tin-smith. My preceptor was the first dentist in New England, so far as I am aware, to take an impression in plaster, but it was several years before it came into general use, and the material was of an inferior quality.

My first experience in the making of dies was in the use of tin. In order to do this the counter, or as then termed, the female die, was made first, by plunging the model perfectly dry, into the lead. The removal of the model necessitated its destruction. A rim of several thicknesses of paper was placed around it and the tin poured into it. After a time type-metal, zinc, and brass were used. After I had been in practice for myself some two years, I was led to try what was then known as "Babbitt's anti-friction metal," then just introduced into this country for machinery bearings. This, with some slight modifications I have used ever since, finding it the only alloy that has all of the requisite qualities for a dental die, and has greatly simplified the fitting of plates.

At this time, or at my entrance upon the stage, spiral springs were an absolute necessity for retaining an upper plate in place, and so continued for many years afterwards in the practice of many dentists, and I am informed are still considered a necessity in England. My preceptor was the first dentist in New England who first constructed a suction-plate, in the year 1844. If any one knows of any attempts prior to this I would be pleased to be informed.

The impression was taken in wax, the die made of tin, and the result very gratifying. In order to test the suction, he soldered a hook to the center of the plate, placed it in the mouth, told the patient to suck it up, attached a wire to it, and suspended thereto an ordinary water-pail filled with water, and placed other weights upon that. These plates were fitted to the palate, the "air-chamber" known as the Gilbert, being introduced later. came into general use; and still later what was known as the Cleveland or soldered chamber. I have, however, dispensed with all forms of air-chambers for twenty-five years, deeming them altogether superfluous, in fact, in many cases highly detrimental.

The carved bone and ivory teeth had been displaced by porcelain teeth. The first I used of these were Alcock's, made in

Philadelphia. These were followed by Stockton's, which were an improvement on the former. A few years later his nephew, S. S. White, who obtained his knowledge of the business from his uncle, established a factory under the firm name of Jones, White & McCurdy, and soon produced an article far superior to any thing previously made. In fact as regards translucency and delicacy of coloring superior to any thing now made. But afterwards in order to increase the strength, these features were in a measure lost, as the increase of silex and clay made them more opaque.

Up to this time all dental goods were sold by druggists. This firm entered into the manufacture of other dental goods and established dental depots in Philadelphia, New York and Boston. They kept no supply of plate and solder, and the dentist if he did not make it himself, resorted to the manufacturing jeweler for his supply.

Every tooth was soldered to the plate, and skill was required in selecting, grinding to the plate, backing and soldering full sets of gum teeth, an experience which few practitioners of to-day have had.

The use of gas for soldering was not known till a later date, and the alcohol lamp and mouth blow-pipe were the appliances then used.

Lathes were of rude construction. Emery wheels and not coarse at that, were used for grinding. What a contrast to the modern dental lathe, electric motor and carborundums. The appliances for finishing were few and rude. Think of the various appliances used on the dental engine for finishing and doing fine work.

At the time I commenced the business, carved block teeth were being introduced. These of course were carved for each case and for eleven years I was engaged in carving and mounting for our own practice and for the profession in the New England states.

My first experience in the laboratory was the preparation of the material, calcining, breaking in small pieces and grinding in a quartz mortar, quartz and felspar to an impalpable powder. These, together with clay or kaolin and coloring matter of the oxides were then mixed ready for carving. Oxide of gold and tin were used to produce the flesh color of the gum enamel.

Then there was the management of the furnace, constructed of fire-brick, and soap-stone covers and stoppers, with two or more muffles. The baking was done in the latter part of the day, and running sometimes into the night quite late. The work was not examined till morning. Carving, biscuiting, trimming, putting in the platina pins, enameling and baking of two sets was considered a day's work.

A considerable number of dentists learned to do this, but with varying success, as it required skill and taste which all did not possess. I instructed the fathers of quite a number of the present generation.

In 1852 an agent of John Allen's came to Boston to sell office-rights for the use of his new patent, since known as Allen's Continuous Gum Work. We purchased an office-right for \$150, and have continued the use of it to the present time. For full sets this was the greatest advance made in prosthetic dentistry, and remains to-day the most perfect denture ever devised, for strength, durability, naturalness of appearance, healthfulness to the membrane and cleanliness.

Soon after the introduction of vulcanized rubber, dentists in various parts of the country made a combination of continuous gum and rubber, which had its run for several years, and was then abandoned. One dentist who made it for several years was afterwards asked his opinion of it, replied, "It was like the devil's tail painted blue, more ornamental than useful." The serious objection to it was like some other combinations, it made the repair too expensive.

Like some other "discoveries" this method has been discovered, or re-discovered, several times since, patented and presented to the profession as something original. The lesson to be learned from this is, that no denture should be put in the mouth which cannot be readily repaired at a fair expense.

I think it was in the year 1852, a dentist named Slayton, came to Boston to introduce a method of inserting dentures on gutta-percha. I have in later years made use of it in what I call "emergency" work. As for instance, a physician came to my office at 5 P. M., had several teeth extracted, impression taken, a plate of sheet gutta-percha formed on the model, teeth arranged, and fastened to a rim of the same material by heat, and the gum contoured with a hot spatula; at 7:30, two and a half hours, he

was eating his dinner with his new teeth at a restaurant. Also a temporary lower plate, made in the same manner in three hours, while the patient waited, lasted one year.

Also about the year 1852, a dentist named Levett, came to Boston to introduce an enamel for gold plates. I was wearing a small gold plate and had it enameled, but in a short time it cracked off. It convinced me that enamel which could be baked upon gold plate was merely glass and not fit to be worn in the mouth. This is also one of the "inventions" which has been "discovered" several times and found worthless.

About the same time, or a little earlier, Dr. Loomis, of Cambridge, Mass., patented the porcelain plate, which has been improved upon to some extent, and is still used by a limited number of dentists. A first class artistic denture, cannot be made by this process, and is difficult of repair.

I think about the year '55, Dr. Blandy, of Baltimore, introduced a metal he called "cheoplasty," for making cast plates. It was similar to Watt's and Weston metals composed of tin and bismuth.

In 1858, then in business in Chicago, associated with Dr. Allport, I made a visit to Boston, and calling upon an old friend, Dr. J. A. Cummings, he took me aside and showed me in a confidential way a vulcanized rubber plate, for which he said he had applied for a patent. The outcome and history of which you are familiar, with some to your sorrow in the contest with Bacon.

The introduction of this material caused a retrograde movement in prosthetic dentistry, and although it has its merits, has been a detriment to the profession, for so simple are its methods that it has enabled a host of incompetent men to foist themselves upon the community, and also led many of the better class of dentists to abandon a class of work far superior, simply because the work was easier, and could be done by mere novices in the laboratory.

Dr. Allport has well expressed the idea in an address before the Boston Academy of Dental Science:

"He who has but moderate ideas of symmetry, harmony of expression and color is constantly pained by the lack of that artistic selection and arrangement of artificial teeth which serves to restore to the face the shape and expression left upon it by the Creator, the absence of which in artificial dentures stamps him

who should be an artist, an *artisan—a mere mechanic—a libeller of the soul—a deformer of the human face divine*. That mechanical dentistry should have very largely fallen into the hands of this inferior class of practitioners will hardly be wondered at by those who have watched the history of this branch of the practice. For so simple are the modes of attaining tolerable mechanical results with the methods now usually employed in this department, that a high order of appropriate talent is, at the present time, seldom found devoting much time to it."

The most serious objection to the use of rubber is found in the fact that the retention of undue heat causes constant change in the alveola process, the exceptions to which are very rare.

In the early 60's Dr. McClelland, of Louisville, introduced a material for plates which he termed "Rose Pearl," a preparation of gun-cotton and camphor. This was followed by an improved article called Pyroxolene, which made a very handsome plate but proved a failure, I made several plates of it. Next came celluloid, a decided improvement upon the other, and which has continued in use until the present time. I used it instead of rubber for four years and then abandoned it.

One of the more recent inventions has been the "Electro-deposit plate," professedly gold, but only a silver plate with a very thin deposit of gold on its surface. It has very serious objections and those who have used it, so far as I know them, have abandoned it.

Although aluminum has been used to some extent for plates for many years, it did not prove a success until recently, on account of the difficulty arising from the presence of specks of iron in the metal, which rusting produced holes in the plate. It makes a firm and more rigid plate than any other metal and is easily swaged. I find the secretions do not affect it at all. By using the loop-punch a firm adhesion of the rubber is obtained.

Ever since the introduction of rubber and celluloid there has been a set-back to prosthetic dentistry until the introduction of crown and bridge-work, which has made it necessary for the dentist to learn the use of metals, so that to-day prosthetic dentistry occupies a higher plane than ever before.

Dr. Land is entitled to credit for the introduction of the "jacket crown," etc. But far greater is Dr. Parmly Brown's method of porcelain crowns and bridges, which seem to me the

ne-plus-ultra of prosthetic work, its two important features being the non-mutilation of teeth and showing no metal in the mouth.

The introduction of porcelain work to such an extent has necessitated the invention of gas furnaces, so that one improvement after another has developed some almost perfect furnaces. The Parker, an open-flame furnace, has done most excellent work, followed by the Downey with a platinum muffle which seemed almost perfection, until recently Land has brought out a furnace, the "*Revelation*," in which coal-oil is used. In this furnace no bellows is needed, simply a good draft in a chimney. The high fusing bodies have been fused successfully. I am using it satisfactorily.

Although there has been great improvement in the manufacture of teeth there is still room for more. One serious fault is the unnecessary multiplication of moulds, sometimes done to satisfy the whim of some dentist, but oftener because the manufacturer fails to realize the real necessities of the case. In the S. S. White catalogue of teeth are nearly one hundred moulds of *upper plain bicuspid and molar rubber teeth*! Many of them so near alike it is difficult to distinguish between them; others so unshapely it is a wonder any one finds a use for them; but the most serious fault is found in the fact that even in the longest of them there is little porcelain above the pins. In grinding to articulate, this small amount of porcelain is often ground away or so nearly so that what is left is broken off very soon. Not only this but the rubber gum comes so near the crown that it is unsightly. In nearly all of these teeth the pins can be placed in a position to give longer cusps. The Company however have been making some new moulds in accordance with these suggestions.

There are too many moulds with too little masticating surface; too often the lingual cusps of the upper teeth are too long, —should be shorter than the buccal.

In plain upper rubber bicuspid and molars twelve variations of moulds would be all that is necessary, and consider how this would simplify the selecting of teeth by the dentist or the depot clerk.

These same faults exists to a greater or less extent, in all makes of teeth. I would very much like an expression of opinion upon the subject by dentists.

In the teaching of prosthetic dentistry in the colleges there are serious faults, the reasons of which are three-fold.

1st. Too much of the students' time is occupied in the lecture room, in the endeavor to teach him *methods* which can never be comprehended until he *sees* them done or does them in the laboratory.

2d. In the laboratory he is taught in classes, and not enough individually and these classes so large as to be unwieldy.

3d. The demonstrators are too often inexperienced men, graduates perhaps of a previous year. In no place in a college is wide experience more necessary than in the laboratory.

COMPILATIONS.

CROWNING BADLY DECAYED ROOTS.

BY W. C. LOGAN, D.D.S., ASTORIA, OR.

How often in the course of practice are we confronted with a root or roots of teeth decayed far beneath the free margin of the gum, and perhaps one side extending well down in the alveolus. After removing the decay we find but a mere shell to work upon, and the question arises, Shall we extract or attempt to save the remnant? When the patient wants the tooth saved, if possible, then it is our duty as dentists to devise some means of putting such teeth in a condition of usefulness. In the following I will describe some of the means I have employed in a few cases, with the hope that some one may be benefited thereby.

The first case, that of right superior second bicuspid in (with this exception) an almost perfect set of teeth; the distal margin decayed well down in the alveolus. After pressing the fungous gum aside the decay was removed. On nearing the walls of the root the operation was quite painful, showing how little dentine was left. After the decay was removed a piece of gutta-percha base plate was softened, dipped in campho-phenique and carried to the apex, followed by a pledget of absorbent cotton, and the patient told to rest a few minutes while preparations for the next step were taken: that was in getting ready cement, alloy and mercury. The root was then thoroughly dried by hot air, the amalgam mixed and held in the hand while mixing the cement, which was quickly carried to the root and pressed well up to the gutta-percha before spoken of, followed immediately by the amal-

gam, which was built down about one-sixteenth of an inch below the gum. After the amalgam had set enough to permit, a corundum disk was used to bevel the edge of the root and amalgam, and a gold crown adjusted the next day. This was three years ago, and it is as sound now as it was the day it was put on. The patient uses it the same as the other teeth and has no trouble with it whatever.

The second case, that of right superior central, the history of which may be briefly stated, is as follows: Some twelve years ago the crown was lost, and soon after an abscess formed at the apex. The tooth was treated and temporarily relieved, when it again gave trouble. Nothing was done for a year when another attempt was made to fix it, but with the same results. Nothing more was done until the patient came to me with the question, "What can you do with this root so that it will not give me trouble?" After an examination I decided to crown in such a way as would strengthen the shell of the root and still be able to treat the tooth, should trouble recur, without removing the crown. This was done in the following manner: Removing all decay and making two tubes, one to fit the other, the larger was fitted to the canal, and combination filling put in around it and built up as before described. This gave a solid foundation to work on. A ferrule was made and put in place, then with a spear-point drill a hole was made through the ferrule into a large tube already in place. The smaller tube was then placed into position with the end well up to the apex, the other end exposed about one-quarter of an inch, an impression taken, varnished, soaped and poured with marble dust and plaster. Care should be taken in cutting out the model, as the marble dust and plaster are very brittle. A plate tooth previously selected was fitted and waxed into position with sufficient marble dust and plaster to cover the face of same. After drying the case was soldered, finished and put into position, cotton was dipped in campho-phenique and carried into the tube to apex of the root, and the opening on the lingual surface was sealed up with gutta-percha. This case has been in place two years and has not given any trouble whatever. The surrounding tissues have a healthy appearance and the tooth bids fair to do good service for an indefinite period. If trouble should recur we have it in such a way as to give immediate relief.

The third and last case, that of a right upper second bicus-

pid, the patient, (a lady) did not care to have a gold crown. The root was prepared the same as in the second case with a tube set in; a ferrule with solid pin was used, and a crown with a porcelain filling and gold cusps was made in the usual way and mounted, and now is doing good service.

Here, then, we have three similar cases fixed satisfactorily in as many different ways, and all doing good service, giving us a number of ways to select from to suit almost any case that may come under our notice.

Although the above cases have not been in place long enough to be pronounced successful, the indications are at present that they will be successes. I think that in this way we may be able to save a good many roots of teeth which are now sacrificed to the forceps, and have them do good service for years to come.—*Pacific Coast Dentist.*

DENTISTRY CONSOLIDATION ACT, PROVINCE OF BRITISH COLUMBIA.

WHEREAS the profession of dentistry is extensively practised in Europe, the United States, and in the Dominion of Canada; and whereas the said profession of dentistry is protected by law in Europe, the greater portion of the United States, and in parts of Canada; and whereas it is expedient for the further protection of the public that there should by enactment be established a certain standard of qualification required of each practitioner of the said profession or calling, and that certain privileges and protection should be afforded to such practitioners.

Therefore, Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of British Columbia, enacts as follows:

1. This act shall be cited as the "Dentistry Consolidation Act, 1895."

2. It shall be unlawful for any person to practise, or attempt to practise, the profession of dentistry or dental surgery in the Province of British Columbia who is not a member of any College of Dentistry of any of the Provinces of the Dominion of Canada having authority to grant certificates of license to practice dentistry; or who is not a member of any College or School of Dentistry having like powers; and who does not produce sufficient evidence

of such membership, and testimonials of good character; and who does not pass a satisfactory examination before the Board of Examiners as authorized by this Act, and pay the required fees: Provided that nothing in this Act shall be so construed as to prevent physicians and surgeons and others from extracting teeth, but no person extracting teeth under the powers conferred by this section, excepting properly qualified dentists, physicians or surgeons, shall collect pay for such extracting of teeth.

3. A Board of Examiners consisting of five practising dentists, residents of this Province, is hereby created, who shall issue certificates to persons in the practice of dentistry or dental surgery in this Province, and whose duty it shall be to carry out the purposes and enforce the provisions of this Act.

4. The members of the said Board of Examiners shall be appointed by the Lieut. Governor in Council, who shall select them from ten candidates, members of the British Columbia Dental Association, the said ten candidates' names to be submitted by the said British Columbia Dental Association. The term for which the members of said Board shall hold their offices shall be five years, except that the members of the Board first to be appointed under this Act shall hold their offices for the terms of one, two, three, four and five years respectively, and until their successors have been duly appointed. In case of any vacancy occurring in such Board, such vacancy shall be filled by the Lieut. Governor in Council from twice the number of names of members of the British Columbia Dental Association submitted to him.

5. The said Board of Examiners shall keep a record in which shall be registered the names and residences or places of business of all persons authorized under this Act to practice dentistry in this Province. The said Board shall elect from its members a President, Secretary and Treasurer, and shall meet at least once a year, or quarterly if required. A majority of the members of the said Board shall constitute a quorum.

6. Every person desirous of being examined by the said Board touching his qualifications for the practice of the said profession of dentistry shall, at least one month before the sitting of the said Board, pay into the hands of the Secretary the required fees, together with satisfactory evidence of the qualification and requirements of Section 2 of this Act.

7. To provide for the proper enforcement of this Act the

said Board of Examiners shall be entitled to the following fees, to wit: For each certificate issued to persons engaged in the practice of dentistry in this Province at the time of the passage of this Act, the sum of ten dollars; for each certificate issued to persons not engaged in the practice of dentistry at the time of the passage of this Act, the sum of thirty dollars.

8. There shall be allowed and paid to each of the members of the said Board of Examiners such fees for attendance not exceeding ten dollars per day, and such reasonable travelling expenses, as the said Board shall allow from time to time; said expenses shall be paid out of the fees and penalties received by the said Board under the provisions of this Act.

9. All moneys shall be held by the Treasurer of said Board as a special fund for meeting the expenses of said Board, he giving such bonds as security as the Board may from time to time direct.

10. The said Board at its first meeting, and from time to time thereafter, shall make such rules, regulations and by-laws not inconsistent with the provisions of this Act as may be necessary for the proper and better guidance of the said Board, which rules, regulations and by-laws shall first be published for one month in the British Columbia Gazette, and in one or more newspapers circulating in the Province. Any or all of which rules, regulations or by-laws shall be liable to be cancelled and annulled by an Order of the Lieut. Governor in Council.

11. The Secretary of the said Board shall, on or before the fifteenth day of January in each and every year, enclose to the Provincial Secretary an annual report of its proceedings, together with an account of all moneys received and disbursed by said Board of Examiners; also a list of the names of all persons to whom certificates have been granted, and the qualification therefor, and such list shall be published in the Gazette.

12. In case a charge is made against any licentiate of unprofessional conduct, or other misconduct provided for by the by-laws to be passed under the provisions of this Act, the Board of Examiners shall have power to hear and determine the same, and for this purpose to summon witnesses before them and administer an oath or affirmation to such witnesses, and if any licentiate shall be found guilty of any charge preferred against him he shall forfeit his certificate and title, and the same shall be cancelled, sub-

ject to appeal to a Judge of the Supreme Court if brought within ten days; such forfeiture, however, may be annulled and the said license and all rights and privileges thereunder fully renewed and restored by said Board in such manner and upon such conditions and terms as the said Board shall think fit: Provided, however, that nothing in this Act contained shall empower the said Board to deal with any criminal or other offence provided for by law.

13. If any person after the period of three months after the passage of this Act, not holding a valid certificate, practices the said profession or calling of dentistry, or dental surgery, or wilfully and falsely pretends to hold a certificate under this Act; or takes or uses any name, addition or description implying that he is duly authorized to practice the profession or calling of dentistry, or dental surgery, he shall, upon a summary conviction thereof before any Justice of the Peace, for any and every such offense, pay a penalty not exceeding one hundred dollars or less than twenty-five dollars, to be recovered on summary conviction, and the half of any such penalty shall be paid to the Board of Examiners; and it is further provided that no person who is not qualified under the provisions of this Act shall recover in any court of law for any work done or materials used by him in the ordinary work of a dentist.

14. The said Board shall also have the power and authority to fix and determine from time to time a curriculum of studies to be pursued by students, and to fix and determine the period for which every student shall be articulated and employed under some duly licensed practitioner, said term not to exceed three years, and the examination necessary to be passed before the Board, and the fees to be paid into the hands of the Secretary of said Board, before receiving a certificate of license to practice the profession of dentistry.

15. All notices required by this Act to be published in the Gazette, and all expenses to be incurred under this Act shall be at the cost of the Board, to be paid out of the funds mentioned in Section 9; in case of deficiency, to be levied by assessment against the members of the profession.

16. The "Act to regulate the Practice of Dentistry," Chap. 34, Consolidated Statutes, 1888, is hereby repealed.

ALL SORTS.

Cool Off Slowly.—In making vulcanite plates we fail in securing a good fit sometimes by cooling too quickly. The best fitting plates I have are left in the vulcanizer twenty-four hours after vulcanizing.—*O. Howe, Items.*

Rubber-dam Clamps.—To adjust rubber-dam clamps painless, slip over their jaws small pieces of rubber tubing. There is another advantage gained by it—you are sure of a water-tight fitting around the tooth.—*Dominion Dental Journal.*

Useful Impression Material.—Ordinary glazier's putty molded to the right consistency and perfumed with oil wintergreen, is, in my hands, a useful impression material for crown work, on which fusible metal can be cast with great perfection.—*W. S. Elliott, Items.*

To Prevent Breakage in taking Plaster Impressions in a Difficult Case.—Before the addition of plaster to water, add some fine cut fibres of absorbent cotton. A small quantity will thus give more body to the plaster in the event of breaking, and the fragments will not separate entirely, owing to the presence of the cotton.—*Odontologie.*

To Make a Hot-Air Syringe.—To those who would like to use a hot-air syringe I would suggest a very simple and easily-made substitute. Procure a small brass blow-pipe, one with a bulb, and which separates near bulb; to this attach a double bulbed air pump for continuous blast, and you have a hot-air syringe as good for all uses as can be bought.—*C. H. Lovejoy, Items.*

Mouthwash for Use in Treatment of Pyorrhea Alveolaris.—Prescribe the 3 per cent. aqueous solution of pyrozone, with a soda-mint tablet dropped into the quantity to be used each time. This overcomes the soapy taste, hastens the liberation of the extra atom of oxygen, and increases antiseptic action; also neutralizing the small degree of acidity present.—*W. X. Sudduth, Items.*

Obtunder for Sensitive Dentine.—Dr. N. H. Keyser says: I have used for obtunding sensitive dentine the following formula:

Ether (Squibbs) -	-	-	dr. $\frac{1}{2}$
Oil Mustard -	-	-	gtt. 15
Oil Cinnamon -	-	-	gtt. 20

This should only be used when the rubber dam has been adjusted around the tooth.—*Dental Office and Laboratory.*

A Transparent Mirror Glass, says *Invention*, introduced by Herr Alfred Rost, of Halbstadt, reflects light on one side, from which it is practically opaque, while from the other side it is transparent. It is proposed to use this type of glass for glazing windows in the streets of a town; for, while it will not cut off light or vision from the interior, it will prevent outsiders from seeing into a room. It is probable that none will welcome this discovery more than a dental surgeon whose consulting room happens to be in the front of the house.—*Dental Record*.

A Good Engine Cord.—An engine cord may be made at a cost of three or four cents from a pair of ordinary round twilled corset laces. Cut one of the brass tags off, and by means of the tag on the other lace telescope one lace end over the other one or two inches. Take the other ends, and, after measuring, cut off one to the proper length and proceed as with the other ends. The tags may be passed out through the sides and cut off when inserted far enough. A few stitches through the telescoped ends will hold them secure.—*Dominion Dental Journal*.

Local Anesthetic.—Gum Camphor fifty-five parts, mixed with forty-five parts Crystallized Carbolic Acid, I find useful as a local anesthetic for simple operations. It is particularly useful used topically in extracting loose teeth, or after extraction where there is a tendency to hemorrhage. I might multiply these various formulas indefinitely, and might name a host of drugs which have from time to time been recommended to relieve the pain attending dental operations, or the pain attendant upon dental irritations of various kinds.—N. H. KEYSER, *Dental Off. and Lab.*

An Easy and Safe Method of Removing Pulp after Devitalization.—Take a watch-maker's pivot broach, known as the Swiss broach, anneal it, wind a few shreds of cotton around the end, push it into the pulp cavity and slowly twist it. As the cotton is wound around the broach, the pulp will cling to the cotton, and thus will be taken out whole, without the danger of breakage usually accompanying the use of barbed broaches. It is not necessary to carry the instrument to the end of the root, but some cotton should be forced ahead of the broach before twisting it.—*Dental Digest*.

To Prevent Surgical Needles from Rusting, and at the same time keep them Antiseptic.—Dr. Hanks uses Lysol. He places a number of assorted needles in a wide-mouthed bottle, points upward, and fills the bottle with Lysol. When he wishes to use a needle he empties the bottle into a shallow dish and selects the needle he requires, and

pours the Lysol and needles back into the bottle again. He at the same time uses this Lysol for an antiseptic, should he not have any other handy.

[The above is also very good for dental instruments, especially nerve-canal instruments.—C. E. K., *Dominion Dental Journal*.]

Mounting Disks and Points.—Dr. T. F. Chupein, in the *Dental Office and Laboratory* says: “The best way to mount disks and points for the dental engine is with phosphate cement. Mix this thin or to a creamy consistency. Drop a small quantity in the hole of the disk or point, and daub a little on the end of the mandrel. Place the mandrel point in the hole of the disk, and make it true by putting the shank of the mandrel through the “disk setter.” Let this remain until the cement gets perfectly hard, and you will find that the disk or point will never separate, which cannot be said of mounting these with gum shellac as is generally done.”

A Hint.—Dr. C. A. Chupein, in the *Dental Office and Laboratory* says: “We are aware that rubber for separating the teeth is little used on account of its great activity and of its disposition to work its way towards the neck of the tooth, thereby pressing on the gum and causing considerable pain. Yet rubber is made into special forms and used for this purpose still. This style of rubber often gets quite stiff, hard and rotten, making it, when wanted, unfit for use. Rubber dam is always at hand, is always fresh and always ready for use. If a piece of this be *twisted into a roll between the thumb and fingers* it can be made into any size necessary for the case in hand, and being thus made cylindrical, is in the best form for application. Three, four, five or a dozen turns can be made of a small discarded piece of an inch square to place between the teeth to effect their separation.”

Rapid Method for making Partial Gold Plates.—Dr. Sidney S. Stowell, Pittsfield, Mass., gave a demonstration of his rapid method of making partial gold plates, making one in eleven minutes. He takes an impression in plaster or any of the modelling compounds, into which he pours Mellotte's Metal (as cool as it will flow). He then blackens the male die by burning a match underneath it to prevent the counter die from sticking to it. He then builds up the edges of the die to form a cup, into which Mellotte's metal is poured to form a counter die. Two or three thin plates, gold No. 32 guage, are swaged separately, and then placed together and swaged again, after which the thin plates are soldered together. In this manner any thickness of plate required can be made. The doctor claims better adaptation to the mouth can be made in this manner.—*Dental Register*.

Gold and Porcelain Crowns.—Dr. S. W. Twilley, Baltimore, Md., described his method of making gold and porcelain crowns similar to the Richmond system, arranged so that the porcelain fronts can be adjusted or replaced at any time. The band, cap and pin are united with solder in the usual manner. The porcelain front is then provided with a heavy backing and attached with soft wax, not bending the pins. The porcelain, is then fitted to the cap and attached with hard wax, after which the porcelain is separated from the backing with a thin bladed instrument. Lead points, No. 4 $\frac{1}{2}$, such as are used for lead pencils made by Henry Cohen, of Philadelphia, are used in the holes caused by the withdrawal of the pins, with the ends left projecting slightly. The parts are then placed in plaster and marble dust and united with solder in the usual manner. The solder flows around the carbon points, after which the carbons are removed with a drill and the holes slightly counter-sunk. The crown is then set with oxy-phosphate of zinc and the ends of the pins riveted.—*Dental Register*.

The Treatment of Root Canals.—Referring to this subject Mr. W. E. Harding said: "A large number of those met with in practice were small, indistinct, and difficult of access, so that they could not be thoroughly cleared. For a number of years he had used a ten per cent. solution of bichloride of mercury in absolute alcohol, applied to the pulp chamber on cotton wool or other fibre, with great success. But since Dr. Miller's paper, read at the Chicago Congress in 1893, advocating the use of a pellet formed of one-tenth of a grain each of bichloride of mercury and thymol, he (Mr. Harding) had adopted this method in some two hundred cases, but using pellets of only one-fifteenth of a grain, and by far the larger number of cases were very successful. He did not advocate this treatment for cases where the canal could be got at, as he was strongly in favor of filling all root canals where possible, but in almost inaccessible positions the plan he had suggested would be found valuable.

Mr. Betts said that he had recently been rather disillusionized with regard to the solution of bichloride of mercury in alcohol. An eminent chemist had informed him that after heating for a short time the bichloride became mono-chloride, therefore, when the bichloride in a solution of alcohol was put into the root of a tooth the bichloride became a mono-chloride."—*Dental Record*.

Resorcin.—In a talk on this drug before the Stomatological Club, of San Francisco, Dr. R. H. Cool said he was indebted to Dr. A. W. Harlan for this remedy and made no claim for originality in its use.

Regarding its use about the gums, we learn from the *Pacific Coast Dentist*, that Dr. Cool said:

“For restoring diseased and receded gum margins to health and position it is exceedingly valuable. The teeth should be cleansed of all deposit by means of delicate scalers, etc. ; and in the endeavor to restore the gum about the neck of the tooth a crescent-shaped incision should be made with a sharp lancet through the gum to the alveolar process, if it be present, and if not to the root itself, near its border ; to this apply the crystal resorcin. It is well to then pencil the margin with iodide of zinc, carried upon orange wood, for coagulation. The process of healing should not be disturbed now for about three weeks, while the following mouth-wash is prescribed :

R	Ol. Cassia	-	-	gtt. v.
	Resorcin	-	-	gr. xxx.
	Alcohol	-	-	oz. ij.
	Aq. q. s.	-	-	oz. iv.

At the next sitting an incision upon each side of the former one should be made, care being taken to avoid the cicatrix that has been formed, and these filled with resorcin. Three weeks later another incision toward the root should be made and filled with the same agent, and, as before, avoiding the cicatrized tissue already formed. This produces an adhesive inflammation, which is not destructive and draws the separated parts together. It acts as a specific for apthous sores ; applied in crystalline form the soreness is almost at once relieved.”

Are the Teeth Dependent for their Vitality upon the Presence of the Inferior Dental Nerve in the Inferior Dental Canal ?

—Referring to this subject Dr. G. V. Black in the *Dental Review* says :

“I have made the sections of a good many teeth after injection so that the blood vessels could be readily followed, and I may say that I do not know of any reason why the pulps of the teeth should die from the removal of the contents of the inferior dental canal. The collateral circulation is so very abundant through the Haversian canals from the alveolus to the periosteum, or from the peridental membrane to the periosteum, that cutting off the blood supply passing through the bone of this canal, certainly would not rob the teeth of blood ; indeed, you may cut off the blood supply from the apex of the root, and then cut off blood supply under and over the rim of the alveolus, and you have not injured materially the blood supply. Now, so far as the peridental membrane is concerned, you have not injured its sense of pain or its sense of touch, by cutting off the nerve supply that comes into the peridental membrane and into the dentine of the root over the margin of this alveolus. This blood supply seems to be very abundant, and so long as

this blood supply may reach the apex of the root, certainly the pulp may live and be sensitive, and will not die on account of the removal of the contents of the canal.

In one case where the contents of the canal were removed a short time ago, I found anesthesia over a small portion of the lower lip. I do not expect the pulp of this tooth to die. I do not see any reason why. In regard to the subject of blood vessels or contents of the inferior dental canal, well if any of you will examine a well injected specimen of the vessels of this region, the peridental membrane and periosteum, you will see you have no use for a branch at all, the collateral circulation is abundant."

Alveolar Abscess.—Dr. N. Pearson says: "We do sometimes meet a case where there is fistula without an apical opening, or if there is one we are not able to find it, and no remedy can be forced through without drilling. In such a case we will find a broken Morey drill made sharp by stoning two sides to a cutting edge, or by using the regular Morey cutter very effective, using due care in choice of roots to be opened or such as are accessible to straight drills, and open them only at the apex. In dealing with roots of this kind I have been able, especially in inferior teeth, to force a passage by warming gutta-percha and pushing it into the chamber and canals with the tip of the forefinger or thumb, or an instrument quite as large as the cavity, thus making a strong piston force.

In still other cases where we have a curved root, and in consequence a liability to make a side issue or other good reasons for not piercing the apex, by using a syringe with hydrogen peroxide and getting as near the seat of the abscess as possible through the external opening, and a very mild pressure on the piston, we may be able to persuade the contents of the sac to imbibe sufficient of the antiseptic to effect a cure. There is still another way of getting at an abscess, which for one reason or another we are not inclined to apply other means of remedying, and this is through the process: by using cocaine or other local or general anesthetic or by proceeding without these aids. The operation is not very painful, and is soon done with. In doing this a sharp fissure drill in the engine may be rapidly run over the end of the root, completely severing the connection between root and sac, followed by any good antiseptic and soothing remedy thought best. Cut, and in a few days all trace of abscess disappears.

In the foregoing remarks I have avoided as much as possible strict detail, out of compliment, no doubt, to the intelligence and experienced sagacity of my audience to follow out the ideas to their logical conclusions."—*Dominion Dental Journal*.

Pulp Canal Cleaning and Filling.—In the *Dominion Dental Journal* Dr. M. G. McEllimney says: "To make nerve broaches that will do reasonably satisfactory work, take No. 18 piano wire, and draw the temper a little.

A little experience will enable one to draw to any desired temper for any particular case. A Bunsen flame will do very well. The wire should be left sufficiently stiff to come back straight when the point is deflected thirty or forty degrees. Place a piece of hard wood end up in the vise, and with the corner of a file cut a light groove parallel with the jaws. This groove is to keep the wire from slipping while it is being filed.

Place the piano wire in a pin vise and file it taper with a square section, or slightly flattened for some cases. Care must be taken to make the taper even from butt to point, or the broach will be liable to break.

With a sharp graver nick the square corners of the broach, and the result is a series of barbs that will stand a great deal of use. The barbs may be placed on one, any, or all corners, according to requirement. The butt must be adapted to the particular kind of broach-holder used. For a screw chuck-holder the butt should be made square. For a sliding ring-chuck the butt will stay better if slightly flattened.

A foot of piano wire will make nine broaches, and costs less than a cent. One of these broaches will do more work than three ordinary ones at fifty cents a dozen.

Having now a serviceable broach, it is necessary to use it rightly. It should not be sent to the apex at first, but the debris must be carefully removed as one goes up, care being taken to avoid wadding the narrower portion with debris, as it is very difficult to remove and may get solid enough to be taken for the apex. To properly cleanse a root requires time and patience, for it is a really tedious operation.

Having removed all dead matter that will come out, the next step is the thorough medication of the root. A few fibres of cotton twisted around a fine broach makes a most efficient pump. Each dentist has a favorite preparation for roots—suffice it to say that whatever is used must be used thoroughly.

Having the canals clean and ready to fill, I do not dry them; but rather leave them full of root preparation, which is forced into every crevice by the filling."

A Protest.—In the March *Dental Digest* Dr. C. W. Stainton makes a protest against the use of gold crowns on the anterior teeth. He says:

"The height of art is to conceal art. But this setting of metallic shells formed in imitation of the teeth in the front of the mouth where they invite attention by their foreign and artificial character is not art

in any proper sense of the term. Instead of hiding the evidence of decay in the natural teeth, we call in most emphatic manner attention to that fact.

So great is the variety now of porcelain teeth—almost infinite in shape and color—that it is not difficult to place in the front part of the mouth a porcelain substitute so realistic as almost to defy detection by an expert. What right then—pecuniary, professional or moral—has any man to place in sight anything so pronouncedly artificial, or to attract attention when he should divert it. This advertising the loss of natural crowns instead of hiding it, is wrong. . . .

“No man has the right, whether prompted by his own cupidity or the vanity of his patient, to place a gold shell in any mouth where it will show. In the superior arch of a lady’s mouth a gold shell anterior to the molars ought properly to make a man liable to an action for malpractice. In a gentleman’s mouth curtained by a heavy mustache the rule need not be so pronounced.

It is an unpleasant fact that the manufacture of gold shells for the incisors and cuspids and their sale at the dental depots seems to be on the increase. It is a long step backward in dental taste and decency, and the time is not far distant when we shall realize this fact. This is one of the technicalities in dentistry like copper amalgam, which will soon recede leaving its train of disgusted patients and operators to regret that they ever felt its influence. Many men who would not under any condition put amalgam fillings in front teeth are putting on these crowns, although they are as objectionable. When we practice dentistry, let it be on a higher plane of taste than that shown by native Indians or negroes, who display beads, silver and gold, from ear and lip, and fancy themselves beautiful. We ought to frown on this whole gilded pretence of substitution.

There is no justification of any proper sort, for these shining, brassy disfigurements glistening from the mouth of our duped patients. When they ask for teeth, let us give them teeth and not hang up a gilded memorial tablet to commemorate the loss of their predecessors, the natural organs.”

Question.—*What is the best treatment for perforation of side of root?*

(1) *When first made?* (2) *When it continually discharges bloody matter into root canal?*

1. I should say the best treatment in such a case is the extraction of the tooth. Sometimes, however, this is a serious matter, and every possible effort must be made to save such a tooth. In answering such a question, however, for publication, I would urge the abandonment of the use of drills in pulp canals, thus avoiding the injury referred to to a very

great extent. If a bit of styptic cotton wound upon a small instrument be carried to the injured periosteum, hemorrhage will cease in a few moments; then, after the parts are as thoroughly cleansed as practicable, a piece of gutta-percha is warmed and carried to the spot, taking care not to force it through the drill hole into the wound. Upon this, cement—oxyphosphate—may be applied; the gum over it should then be painted with equal parts of concentrated Tr. Aconite root and Tr. Iodine and await developments. No trouble may follow, but of course, little hope can be entertained that a traumatically injured periosteum, with the elements of constant irritation always present, will behave itself like a normal or uninjured membrane. Gutta-percha is most kindly tolerated by the injured parts of any material we have at hand. 2. Should supuration ensue, and the alveolus become perforated, the rough surface on the root may then be reached and the gutta-percha and root made as smooth as possible, when the parts may again heal over it. My motto has always been, "Prevent rather than cure disease." Consequently, I avoid using drills in pulp canals altogether, except for setting pivot teeth.

FRANK ABBOTT, New York.

1. Apply disinfectant, preferably oil of cloves or oil of cinnamon; these will also act as hemostatics. Then carefully fill the opening with gutta-percha. 2. The discharge of "bloody matter" probably indicates a septic condition in the tissue beyond the perforation. The indications are to thoroughly disinfect. Peroxide of hydrogen, followed by pure creosote, would be a good treatment. When the discharge ceases, treat as in case of fresh perforation.

J. B. WILLMOTT, Toronto.

1. First, with composition, using a specially prepared cup; or secondly, with beeswax, removing thin portion, spreading creamy plaster over impression thus prepared, and reinserting.

D. V. BEACOCK, Brockville, Ont.

Question.—*What is the best method of anchoring anterior end of bridge-supplying bicuspid? Six anterior teeth perfect.*

In my judgment, no anchorage is admissable in bridge-work which does not include a band or cap on both abutments of the bridge. No anchorage into a cavity can be relied on to endure for any length of time. The tooth so anchored into will move on pressure being applied, independently of the other abutment, and of necessity must either loosen the filling in the tooth or loosen the anchorage in the filling. In the case specified, cap or band first molar and cuspid, or, what is probably very much better, make no bridge for the case.

J. B. WILLMOTT, Toronto.

Before mutilating any perfect tooth, consider first the demands upon the bridge; secondly, the strength of abutments necessary to sustain the

life of the bridge, and thus sustain your reputation. I cannot see that it would ever be necessary to amputate a perfect tooth for such a bridge. Rather than do it, it would be better to immediately extirpate the pulp, which, if properly done, gives slight or no discoloration to the tooth; and then utilize the pulp canal for a solid irido-platinum post, dovetailing it so when filled with gold and nicely finished makes a neat and strong abutment. It can also be inconspicuously done by burnishing an apron of pure gold or platinum over the palatine surface of cuspid, making small cavity to receive the head of a platinum pin taken from a tooth, attach to apron by flowing solder over full surface of apron. This makes a good attachment for lady if not too heavy work is placed upon bridge. If the patient is a man and cares little for the appearance of gold, the abutment is good and safe with a well-fitted shell crown or open face cuspid. It is a difficult place for a removal piece. Can see no advantage in this particular case, but where preference can be given it should be given towards adjustable pieces.

FRED. J. CAPON, Toronto.

—*Dominion Dental Journal.*

Kalium Arsenicosum.—The following from the *Dominion Dental Journal* translated by Dr. C. E. Klotz from the *Journal für Zahnheilkunde* is worthy of attention. We would, however, advise caution in its use until the results stated are fully verified.

“**KALIUM ARSENICOSUM.**—A new dental anæsthetic, by Dr. Bauer, Budapest. Amongst the large number of drugs and instruments used for anæsthetic or obtundant purposes, for sensitive or hyperæsthetic dentine, we have no sovereign remedy that will reach the end sought for, viz.: The painless excavating of cavities, but without any injurious effects, local or constitutional. I will not criticise the different drugs on the market. Most of you are acquainted with the defects of different ones.

What are the demands required from a dental-obtunder? (1) It should have no destroying effects on the mineral constituent parts of the tooth. (2) It should have no devitalizing effect on the pulp. (3) It should act promptly and with safety. (4) It should be of easy application. (5) Its application should be painless. (6) It should have no injurious effects, should any of it get on to the soft tissues or into the digestive-tract.

After a great deal of research and experimenting I have found a remedy which possesses the above qualifications. I will not discuss all the cases in detail. No doubt, the gentlemen will try it for themselves, but I wish to give a few hints as regards the application, etc. After the caries of a cavity have been removed as much as can be done without

pain, with the excavator or warm water, the cavity is protected from saliva and dried. The pellet of cotton containing the obtunder and placed into the cavity is prepared by dipping it into a weak solution of carbolic acid, or even water, and then pressed on a towel or napkin to remove as much of the moisture as possible; it is now dipped into the powdered Kalium Arsenicosum, and before withdrawing from the bottle knock off the surplus powder, place it into the cavity, and spread with a ball-pointed plugger, after which seal the cavity with a cement filling, or even in some cases wax will answer. The sealing of the cavity is not done to prevent the drag from coming out, for fear of injury to the soft tissues, as it is harmless to them, but to prevent the saliva from getting into the cavity and diluting it. As it is soluble in water this would impair its effects. After a few hours its action is perceptible, but after twenty-four hours it is absolutely certain. In one or two cases, after twenty-four hours of application of the obtundant, it showed symptoms of slight hyperæmia of the pulp, but which disappeared without therapeutic treatment, simply leaving the tooth alone for a day or two. I have had good success in very young as well as with older patients. I have placed a large quantity of the drug into the cavity of a central incisor of a girl of sixteen years of age, and left it forty-eight hours, covered with Fletcher's cement, without any evil effects, and was able to excavate and fill the cavity in one sitting, when, before the application, it was so painful that I could not touch it with an instrument. Four months have now passed (August '94), during which I have seen the patient several times, and we are both satisfied with the filling.

In what respect does the Kalium Arsenicosum fulfil the foregoing conditions: (1) From its chemical nature it has no decomposing influence on the salt of the dentine. A very thin piece of dentine placed into a fifty or one hundred per cent. solution of the drug for three days underwent no change, either in weight, shape or surface. (2) As before-mentioned it has no devitalizing effect upon the pulp; and the trivial symptoms of slight but quickly disappearing hyperæmia are very seldom. On experimenting I have placed it on to a largely exposed pulp, three or four times, at six to eight hours' intervals without the slightest diminution of the sensitiveness of the pulp. (3, 4, 5) I may remark that the easy application, painlessness and certainty of effects have been proven, both by experimenting and in practice. (6) It is not a caustic. It does not corrode the soft tissues of the mouth; it acts upon the mucous membrane the same as any other indifferent salt, such as table salt, natr. carbon. or magn. sulph. Should it get into the stomach the quantity required to obtund a tooth is so small that it would have no effect whatever. A good sized pellet of cotton would contain about three-fifths

mgm. of the drug, whereas the human system can safely take from one-half cgm. per dose. It can therefore be used with impunity, more so than arsenious acid, which surely is not an innocent drug. The Kalium Arsenicosum does not discolor the teeth. It is only used to anæsthetize the dentine, and in no wise to devitalize the pulp. You will therefore distinguish in excavating a cavity whether the pain arises from hyperæsthetic dentine or pulp exposure. I trust I have found a remedy which will be of benefit to both operator and patient."

EDITOR'S NOTES.

APOLOGIZING.

EMERSON said: "No sensible person will ever make an apology." Perhaps this is a little severe, but are not apologies too common? How often dental writers, and especially those preparing essays for dental society meetings, preface their production with an apology. We admit that a brief explanation is sometimes admissible, but do not apologies tend to weaken, in the estimation of their hearers, the statements of the writer or speaker?

If the production is very bad, those assembled will know it. No amount of apologizing will make it better. If a man promises to write an essay for some society meeting and neglects doing so until the last moment and then prepares it hurriedly, the probability is that the production does not do the writer justice, but does an apology make the essay any better? Perhaps he deserves criticism for such neglect.

Men apologize for many reasons, but the principle ones that come to our mind as we write, are

First, through a feeling of inability to do.

Second, for self laudation.

For the first we have considerable sympathy. If the production does not do the writer justice his hearers will notice and excuse it. They know this man's real ability through association with him and probably realize that writing, to him, is not natural, or, we might add, had never been acquired.

Such men labor at a disadvantage and it is not strange that they feel like apologizing. Yet, if they undertake to do and do the best they can, that is all any one can ask and no apology is necessary.

The second class perhaps write meritorious articles and then apologize for them in the spirit of:

"Oh, I know it's excellent but I want you to understand that it is exceedingly crude compared with what a man of my ability might do?"

Or, they attempt to make you believe that they are apologizing for some failing when they know that this very thing is their greatest gift. It is done with a view of calling attention to their superiority and therefore is to be condemned.

In society discussions the observing person will notice many apologies offered for this or that. For the benefit of apologizers and hearers we venture the following advice: Do not undertake what you know you will surely fail in. If you can say nothing bearing upon a subject under discussion it is better to remain quiet. When you have something to say in discussions say it in as few words as possible. If you cannot tell it in flowery language, express your thoughts in words at command even though your diction be faulty. Do the best you can and let it go at that, but do not impose upon every one by making an apology.

IMPROVED DENTURES.

It is seldom we comment on any of the articles appearing in our columns, but we feel like calling particular attention to Dr. Condit's production in this issue. It has many meritorious features that will become apparent when the article is carefully read. The method of attachment is new and seems to solve the vexing question often presenting, of how to attach and make useful certain forms of bridges and plates that cannot be satisfactorily inserted by any previous method.

From the cases of this work, that we have seen, it seems that it is in advance of anything in this line yet presented.

NEW PUBLICATIONS.

CATCHING'S COMPENDIUM OF PRACTICAL DENTISTRY FOR 1894. B. H. Catching, D.D.S., Atlanta, Ga., Editor and Publisher. Price \$2.50.

Every dentist is familiar with this valuable series of practical treatises; if not he should be. They form a yearly review of the practical information given the profession from all sources. The last edition, just published, is of special value. The subject matter is admirably condensed and edited. Altogether it makes a book of reference worth many times the price of the volume. Aside from compilations the work contains considerable original material of special merit. No practicing dentist can afford to be without these books. The time saved in practice from following suggestions here made, in various quick and accurate methods, etc., is worth many times the cost of obtaining a copy. You should have it; not only this year but every year. Send your name and subscription to the editor and you will not regret it.

A STANDARD DICTIONARY OF THE ENGLISH LANGUAGE VOL. II. Published by the Funk and Wagnalls Co., New York. Sold only by subscription. Price, single volume edition \$12 and \$14. Two volume edition, Half Russia \$15. Full Russia \$17.

The publication of the *Standard Dictionary* places before the reading world a work that is deserving of more than a passing mention. A careful examination of the book, and a comparison page by page and at different points of test with the *Century* and *Webster's*, its two principal competitors, proves in the most conclusive and convincing manner that its merits amply justify its entrance into a field that to an uninformed observer might seem to be already filled.

The *Standard* has a vocabulary of 301,865 words, by actual count, as against 225,000 in the *Century*, 125,000 in the *International* (Webster's), 105,000 in *Worcester's*, and 50,000 in *Stor-mouth's*. This increase, of 76,000 words over a dictionary published so recently as the first named of these, indicates much more than appears on the surface. It means while there are comparatively few unimportant terms treated that all literature has been ransacked for its unrecorded important terms, and that all the trades and the arts have been laid under contribution (in electricity alone something like 4,000 new terms have been entered and described). It means, too, as gleaned by research in trial lines, that the characters in the principal mythologies of the world have been given; the terms in mysticism, formerly accessi-

ble only in special works, the very names of which were unknown to the general reader, have been gathered together and ADEQUATELY EXPLAINED; the science of Buddhism, with its little understood beliefs and system of worship, has been unfolded by Max Muller himself.

In its arrangement, the book is a striking example of what may be done by judicious condensation and system. The idea of grouping of related words and terms is not altogether new, but in no other book of the kind has the plan been carried so far, or so carefully systemetized, and with such excellent results in the way of clearness of presentation and breadth of scope, as in the *Standard*. The explanatory note of *mythology* is such an admirable instance of encyclopedic treatment of a vast subject in a manner so brief, and yet so comprehensive and exact, that we cannot forbear quoting it entire.

"Mythology among the Greeks took the form of idealization of the beautiful and esthetic, (see list of gods at Olympian,); as developed by the Romans it deified virility, war, and the principles of law and order (see list of gods at Pantheon); in India it deified the forces of tropical nature (see Aditi, Agni, Asura, Brahma, Deva, Dyaus, Indra, Kama, Krishna, Nirvana, Purana, Siva, Tripitana, Veda, Vishnu); in Egypt it centered about the Nile and its denizens (see Anubis, Apis, Isis, Osiris, Ptah, Ra, Seb, Serapis, Set, Typhon); in Scandinavia it idealized the struggle with the arctic forces of nature (see Æsir, Asgard, Muspel, Ragnarok, Valhalla, Van). See also anthropology."

This is more than mere dictionary making—it is instruction, and of a kind that indicates on the part of some one remarkable learning and scholarship. The definitions of mythology in the *Century* and *International*, in comparison with this, are scarcely worth mentioning.

Another form of grouping that seems to be original with the *Standard*, is the gathering up under a particular subject of the principal technical words employed in it, so that if the reader requires a word and cannot recall it, he has but to turn to the branch to which it belongs, and the chances are that he will find a list of the principal terms used in the trade or business.

Still other forms of grouping are those by which the derivations of a word are run in under the main word, and compounds and terms belonging to a particular subject are run in under it,

sometimes without definition when self-explaining, with a word or two of parenthetical explanation when necessary.

The general definitions of the *Standard*, from a careful comparison of many of them with the other dictionaries, excel in the points of clearness, sententiousness, and brief comprehensiveness.

The matter of correct pronunciation was referred to an advisory committee of fifty persons, composed of representative scholars in all parts of the world.

The book is illustrated with a number of colored plates. The plate of *gems and precious stones* is one of the most beautiful specimens of the lithographer's art ever turned out. The two volumes of the work contain altogether about 5,000 illustrations, including a number of full page pictures. An important feature for the scientific reader in this connection is the exact definition of the six primary colors of the spectrum, containing the analysis of several hundred shades and tints. Many thousand samples were considered and carefully compared by Professors Hallock and Gordon of Columbia College, in perfecting the color plate and in preparing the table of some 400 formulas which accompany the spectrum plate. This beautiful and instructive *color* plate under SPECTRUM was made by L. Prang & Co., of Boston, in more than 50 separate lithographic printings and at a cost of several thousand dollars.

Extensive tables of coloring substances appear under the words representing the primary colors, constituting a novel and valuable feature, also many other tables as *coin, measure, weights*, etc.

Several hundred pages are devoted to an appendix, giving in one vocabulary order all countries, states, counties, and cities in the English-speaking world down to about 1,500 population outside of that, countries, states, provinces, rivers, etc. In the same list are also included the noted names of fiction, all names of persons (not living) of any note, all Biblical names (for pronunciation, together with other miscellaneous information of great value.

Taken altogether, the *Standard Dictionary* is without a peer. We do not know when before a book has been received with such universal praise by critics and the press of England and America.

We might add many testimonials from the critics and the press, of both continents, but space forbids. Suffice it is to say

that it merits all the praise bestowed upon it, and that it will soon take its place as THE STANDARD.

ANNOUNCEMENT.

A new volume of Useful Hints in Dentistry, by W. H. Steele, D.D.S., is in press and will soon appear. Other books of value to the profession, now being printed, will receive due notice later.

SOCIETIES.

TRI-STATE MEETING.

THE Russell House, Detroit, which will be the headquarters for the Tri-State meeting, to be held June 18, 19, 20, has made a rate of \$2.50 and \$3.00 per day, according to location of room. The Hotel Normandie, an excellent house, just one block from the Russell, has made a rate of \$2.00 and \$2.50 according to room. Dr. W. C. Barrett, of Buffalo, will give a lantern lecture one evening during the meeting. Dr. Barrett has all of Prof. Miller's (of Berlin) bacteriological slides and those of Andrews on enamel formation. Dr. Hollingsworth of Kansas City, will be present to demonstrate his system of crown and bridge-work. Railroad rates will be announced in the June numbers of the dental journals.

G. E. HUNT, *Secretary*.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

THE twenty-fifth annual meeting of the above society will be held in Academy Hall, 42 N. Pearl st., Albany, May 8 and 9, 1895.

The subject of the meeting will be "Green-stain," and divided as follows:

"The Etiology," illustrated with lantern slides, etc., by Carl Theodore Gramm, M.D., Chicago, Ill.

"The Classification," W. C. Barrett, M.D., D.D.S., Buffalo.

"The Therapeutics," S. B. Palmer, M.D.S., Syracuse.

Members of the profession are cordially invited to attend this meeting.

F. T. VAN WOERT, *President*, Brooklyn, N. Y.

C. S. BUTLER, *Secretary*, Buffalo, N. Y.

NORTHERN OHIO DENTAL ASSOCIATION NOTICE.

THERE will be an Executive Session of the Northern Ohio Dental Society, at the time and place of the Tri-State Dental Society meeting, Russell House, Detroit, June 18.

There will be no regular meeting of the society this year.

VERMONT STATE DENTAL SOCIETY.

AT the 19th annual meeting of the Vermont State Dental Society held at Brandon, Vt., March 20, 22, 1895, the following officers were elected for the ensuing year:

President, Dr. E. O. Blarchard, West Randolph.

1st Vice Pres't, Dr. F. P. Mather, Chester.

2d Vice Pres't, Dr. C. S. Campbell, St. Albans.

Secretary, Dr. T. Mound, Rutland.

Treasurer, Dr. W. H. Munsell, Wells River.

Executive Committee, Dr. J. A. Robinson, Morrisville, Dr. L. Cleaves, Montpelier, Dr. H. Turrill, Rutland.

State Prosecutor, Dr. G. W. Hoffman, White River Junction.

Next meeting to be held at Montreal, third Wednesday in March, 1896.

THOMAS MOUND, *Secretary*.

ILLINOIS STATE DENTAL SOCIETY.

GALESBURG, MAY 14-17, 1895.

PROGRAMME—ESSAYISTS.

1. Address by the President, J. H. Cormany, subject, The Saving of the First Tooth.

2. A. W. Harlan, subject, Dental Science and Literature.

3. J. Frank Mariner, subject, Dental Art and Invention.

4. Louis Ottofy, subject, A Review of the Transaction of the Illinois State Dental Society for a Quarter of a Century. Discussion opened by A. W. Harlan.

5. C. B. Rohland, subject, A Simple Method of Keeping Records. Discussion opened by T. W. Prichett.

6. D. M. Cattell, subject, Results of Experimental Root Canal Fillings. Discussion opened by E. K. Blair.

7. C. R. Taylor, subject, The Human Tongue. Discussion opened by Garrett Newkirk.

8. W. V. B. Ames, subject, Combinations of Metals for Amalgams. Discussion opened by E. D. Swain.

9. C. C. Southwell, (Milwaukee, Wis.) subject, Compressed Air in Dentistry. Discussion opened by W. H. Taggart.

10. A. W. McCandless, subject, The Duties of Dentist to Patient. The Duties of Patient to Dentist. Discussion opened by A. H. McCandless.

11. E. H. Allen, subject, The Illinois State Dental Society and the Relation it Sustains to the Dentists of Illinois. Discussion opened by C. N. Johnson.

12. C. R. E. Koch, subject, A Commentary on the Illinois Dental Statute of 1881. Discussion opened by T. W. Brophy.

The following questions will be submitted to the Society for discussion :

1. Can alveolo dental abscess arise after complete sterilization and obliteration of the canal by an impervious filling and if so, from what causes ?

Dr. G. V. Black will open the discussion.

2. What are the best means of diagnosis of pulp-calcification in its several forms ; to what extent does the process demand treatment, and how shall it be treated, (a) with respect to its prevention, (b) remedially ?

Dr. E. Noyes will open the discussion.

3. What is the most satisfactory antiseptic, and best method for root canal sterilization ?

Dr. J. W. Wassall will open the discussion.

4. Is not operative dentistry liable to the same injury from the too prevalent use of plastic stoppings as occurred to prosthetic practice from the introduction of vulcanite ?

The discussion will be opened by Dr. W. A. Johnston.

CLINICS.

The clinics will be a special feature of the meeting and about twenty-five are promised. Among the clinitians are the names of Drs. L. E. Custer, W. B. Ames, J. G. Reid, A. W. Harlan, W. H. Taggart, A. E. Matteson, T. W. Pritchett, C. C. Corbett and others.

LOUIS OTTOFY, *Sec'y.*

OHIO COLLEGE OF DENTAL SURGERY.

THE 49th annual commencement of this college was held in Cincinnati on Tuesday, April 2d, 1895.

The degree of D.D.S. was conferred on fifty candidates.

COMMENCEMENT.

THE fourth annual commencement of the Dental Department of the University of Medicine and Surgery, Cleveland, was held on March 20. There were five graduates: E. S. Kiplinger, M. J. Chambers, L. A. Kellar, S. H. Stevens, and J. T. Newton. Number of matriculates 27.

OUR AFTERMATH.

LOSS BY FIRE.—We are sorry to learn of the loss by fire recently sustained by the burning of Dr. G. F. Cheney's dental office at St. Johnsbury, Vt.

BACK TO HIS FIRST LOVE.—Dr. A. W. Harlan has closed his brief connection with the *Dental Digest* and reassumed editorial charge of the *Dental Review*.

WILL RETIRE.—Dr. M. G. Jenison, of Minneapolis, is about to retire from the active practice of dentistry on account of the enfeebled condition of his nervous system. His present intention is to settle in California, hoping there to regain his health.

THE DENTAL PROFESSION TO BE PERPETUATED.—Dr. and Mrs. Grant Mitchell, Canton, O., are receiving congratulations; it is a nine pound baby boy and arrived April 16th, 1895. The father declares it the handsomest in the State, and we believe it. They say it looks like its Pa.

IDLENESS is the bane of body and mind, a chief cause not only of melancholy, but of many other diseases; for the mind is naturally active, and if it be not occupied about some honest business, it sinks into melancholy or meditates mischief, and finally yields to the influence of the devil.

A LITERARY DENTIST.—The literary writings of Dr. C. N. Johnson, former editor *Dental Review*, are meeting with general favor. His latest short story, *An Original Retribution*, published in the March issue of the *Canadian Magazine*, is a particularly original and meritorious article and has received very favorable commendation from reviewers. The editor of one metropolitan journal states that "it is one of the strongest and most original stories that has appeared in modern fiction."

Dr. Johnson is to be congratulated on possessing such superior ability as a writer and we predict for him a brilliant future in the literary world.

THE OHIO DENTAL JOURNAL.

VOL. XV.

JUNE, 1895.

No. 6.

CONTRIBUTIONS.

OPERATIONS FOR TURNING BOTH UPPER LATERAL INCISORS AT THE SAME TIME BY THE USE OF A TRAPEZE, AND BY THE LONGBAND MECHANISMS.

BY J. N. FARRAR, M.D., D.D.S., NEW YORK CITY.

FOR turning a single tooth there are several mechanisms, but the construction of all of them is based upon applying the force off one side of the long axis of the tooth, or in other words, they all operate upon the principle of the lever acted from a fixed anchorage. These levers may be of considerable length, or only a short knob, each is soldered to a ferrule, and cemented upon the tooth. The anchorage to the engine of force lies in some other tooth, generally made practicable by some kind of band upon it. One of the objects of this paper is to show a mechanism that acts from an anchor, that has no connection with any other tooth than the one to be turned, indeed the anchorage is suspended in mid air. This mechanism also can act upon two teeth, simultaneously. To show the difference between this and the other kind of mechanism other cases will be presented, but these will also have other points, that may be of interest to my readers.

TRAPEZE OPERATION.—Fig. 1, illustrates an operation performed on a boy, requiring the turning of two upper lateral

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incisors. The operation was performed by what I denominate a "trapeze" mechanism, so called because of its resemblance to the trapeze of the gymnasium. Fig. 2 represents the different parts detached, the dotted lines show their relation when in use.

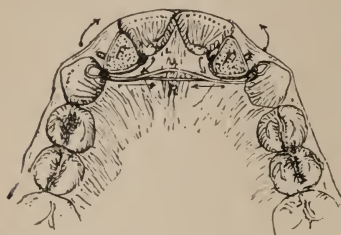


Fig. 1. Turning Laterals in opposite directions by the Trapeze Mechanism.

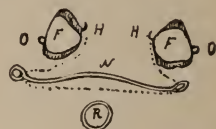


Fig. 2. The Mechanism in separated parts.

The mechanism consists of a rubber ring R; two thin platinum ferrules F.F., each having a hook and a staple; H. O. a gold wire rod; W, having soldered to each end a ring, through which to play the rubber. This rod W, is of sufficient length to extend across the dental arch and project a short distance beyond the laterals, as shown. After the ferrules are so arranged (and cemented) upon the laterals, that the hooks face each other, the rubber ring is stretched from the hook on one ferrule, through a ring on the rod W, thence along the rod, through the ring on the other end, and then caught upon the hook of the other ferrule. (See Fig. 2). The rubber ring being thus stretched along the lingual surfaces of the laterals, draws the hooks toward the rings on the ends of the rod W, and thus turns the teeth.

As the application of the rubber, and rod, is somewhat difficult for a beginner, it may be well to further explain it. Two pieces of string about eight inches in length, are projected through the rubber ring and then by them it is stretched through the two rings of the rod, and held there stretched by the strings to prevent the rubber from drawing back, until the rod and the rubber are carefully placed in the mouth, and the rubber is caught upon the hooks H, H. This may be aided by a right angle plugger, These hooks are soldered close to the gum margins of the ferrules, so that when the rubber is stretched through the rings on the rod which project beyond the laterals, it is enabled, the rubber, to draw oppositely outward and not slip off the laterals. To aid in turning the laterals further, if necessary, after they are moved

outward sufficiently, another rubber ring (see the next figure) is stretched along the labial surfaces of the centrals, and caught upon the staple-like hooks O, O, on the labial side of the ferrules; these hooks when first soldered to the ferrules are rings, afterwards cut open.*

If one lateral requires to be turned further than the other, and it is desirable to correct both at the same time, a corresponding difference in the length of the lever hooks on the two ferrules may be resorted to. In this case, however, I did not resort to making the levers of different lengths, but continued to turn both the laterals until the lagging one was in its proper position, where it was held; and then the other was given its liberty to return; when it had turned to its proper place it was stopped and held stationary.

These laterals were retained in place by two arm ferrules, each consisting of a piece of platinum wire soldered to the labial surface of a ferrule (pure gold). These were cemented upon the teeth, with phosphate of zinc, and were worn one year.

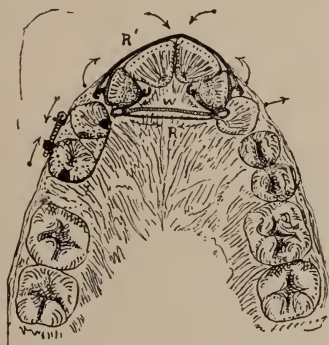


Fig. 3. Similar case.

Fig. 3 illustrates the beginning of a similar operation for the correction of another case of this class. In this figure both the labial and lingual rubber rings R, R', are represented. To make room for the right instanding lateral, outside of which stood the cuspid, first the bicuspid was extracted, and the cuspid drawn back by a clamp-band anchored to the second bicuspid. This left a space behind the bicuspid that eventually closed by the natural moving forward of the molars.

* The second rubber is not always necessary.

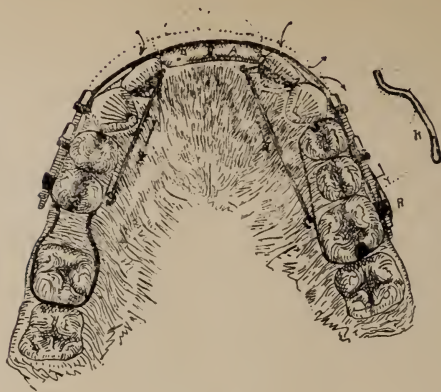


Fig. 4.

Fig. 4 illustrates the last stage of an operation performed for a robust girl about eighteen years of age. The patient formerly had protruding upper teeth in a V arch. By wrong advice, before I saw the patient, she had the centrals extracted, and substituted by artificial teeth, mounted on a hard-rubber roof plate. Although her personal appearance had in a measure been improved by this treatment, her facial contour still retained much of the protruding expression.

Considering the present possibilities from the science and art of correction of irregularities of the teeth, this operation of course could not be regarded as at all proper, for besides the imperfect expression, the patient must now wear artificial teeth during the remainder of her life, unless other teeth are implanted, (an operation which now is being regarded as of doubtful value) if she desires to be comely.

When the patient applied for treatment, the laterals, as well as the artificial centrals protruded sufficiently to rest upon and slightly project over the lower lip, causing it to roll outward. The arch having been originally of a V form (this refers to a die the author mislaid so it does not apply) these laterals stood in a position requiring them to be turned, as well as moved posteriorly.

The first step in the new operation was to secure sufficient anchorage for the mechanism; this was obtained by embracing the side teeth in two clamp-bands, each having a hook soldered on the lingual side. On the left side, the bicuspsids and the first molar were included in the clamp-band, but on the right side,

only the bicuspsids were included in the (other) band. The first molar having been lost, the second molar was pressed into service, by a round platinum wire loop soldered to the posterior part of the band. The next step was the cementing upon the laterals the ferrules. These were represented in the lost die.

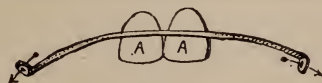


Fig. 5.

Having placed these pieces upon the teeth, a long band B, Fig. 5, (made of round, stiff, platinum wire,) supporting upon its middle part two plate centrals, A, A, was attached to these anchors by screws, which when tightened upon, two or three times per day, caused the lateral to gradually move inward (see dotted line.)

As soon as these teeth had become loosened by this draught upon them, two rubber rings were added within the dental arch, to turn them; these were caught upon the hooks on the lingual sides of the anchor bands, thence stretched anteriorly and caught upon levers on the ferrules of the laterals as represented. A third rubber ring was added on the buccal side to aid in drawing upon the left lateral. R at the right of the figure shows the form of this rubber.

While these changes in the position of the teeth were going on, the artificial teeth, followed the changing line of arch, by

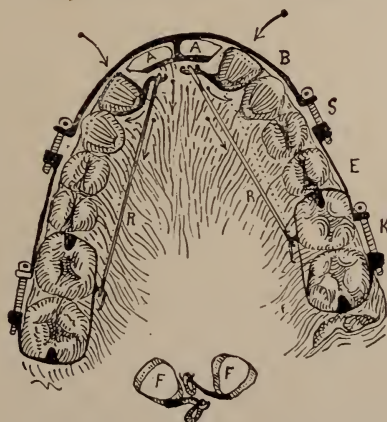


Fig. 6. A similar case.

the tightening of the wire, (long-band,) by turning the screws, connecting it with the anchor bands. The correction of this case

was slow, but very successful, and satisfactory every way. The artificial teeth appeared so natural, that the patient passed in society without anybody suspecting that they were artificial; indeed the wire holding them seemed to be simply a regulating band resting across the front side of the dental arch.

Fig. 5 illustrates the closing stage of an operation for the correction of a similar case by a similar mechanism. The difference between the two mechanisms mainly lies in the anchor band connections E, with the long-bands. The arrows indicate the direction of movement of protruding lateral incisors.

This case is the first that was corrected by a skeleton mechanism bearing artificial teeth.

PRACTICAL POINTS.*

BY DR. WM. H. STEELE, FOREST CITY, IOWA.

WITHOUT attempting a finished paper, I have chosen to present a few rambling thoughts on different subjects as they occurred to me; trusting, that if there is nothing good in the thoughts I present, they may at least be the means of calling forth valuable ideas from others from which some good may result.

A dreamer dropped a random thought; 'twas old and yet 'twas new;
A simple fancy of the brain, but strong in being true,
It shone upon a genial mind, and lo: its light became
A lamp of life, a beacon ray, a monitory flame.
The thought was small; its issue great: a watch-fire on the hill,
It shed its radiance far adown, and cheers the valley still!

Hint on Repairing Rubber Plates.—It is often a difficult matter to obtain a perfect cast of broken plates, especially is this the case if the plate is a lower one, with a good deal of undercut. I get good models of such plates, by casting in sections, and removing one section at a time. The model can be made in two, three, or even more sections if desired; bearing in mind, that they must be cast in such a way, as to avoid the under-cut, and allow of easy removal. Suppose you have a lower plate, broken between the central incisors; take two pieces of base plate wax, warm them, and place them in each section of the plate at the first bicuspid; to form a dam for the plaster to flow against. Now, oil lightly, mix the plaster, and pour each section; when

* Read before the Iowa State Dental Society, May, 1895.

the plaster is sufficiently hard, remove the wax; bore holes, or cut grooves in the end of each plaster section, (to serve as guides) varnish and oil them; place the broken parts of the plate together in proper position, and pour the middle section of the cast. When set, remove the sections, place together in their relative positions; lock in place with plaster, and proceed as usual with the repair.

To Mend a Broken Cable.—A quick and strong way to repair a broken engine cable, is to bend a piece of brass in the shape of a tube, of proper size to fit snugly over the broken ends of the cable. Thoroughly clean the broken ends of all grease and dirt; slip them into the tube; put on a little soldering acid; lay a piece of jewelers' soft-solder along the open joint of the tube; hold the tube over a spirit lamp, until the solder melts and flows into it, and around the broken cable. Trim off all surplus solder, round off all sharp corners, and, if the work has been properly done, this will be the strongest part of the cable.

Convenient Finishing Strips.—The thin pieces of cloth that come packed between the sheets of pink rubber, make excellent finishing strips; the sheet can be torn into strips of the desired width as needed, and used for smoothing off amalgam fillings, cleaning between teeth, etc. Being thin and strong, it also makes a nice vehicle for carrying polishing powders, when finishing gold or other fillings; brush a little glycerine on the strip, and sprinkle with emery, buckhorn-crocus or cuttle-fish powder.

A Cover for the Work-Table.—The composition rubber strips used by stamp makers, for covering the wood face of the mount before putting on the die, make the very best kind of pads for the laboratory finishing table. It looks neat, makes the work of filling and scraping almost noiseless, finished work will not get marred or scratched by coming in contact with it, the piece of work is not slipping around on the bench, but is easily held in place; gold trimmings and filings are readily seen on it, and easily removed. This material comes in rolls of different widths, sells at 60c. a pound, and can be got at any of the rubber dealers.

Retaining Medicines in Cavities.—This is an easy operation in any of the simple cavities, but when applying the arsenical preparations in large approximate cavities, it is often quite difficult to seal it in properly. If the space between the cavity and the adjoining tooth is not too great, a piece of softened gutta-

percha can be formed, and fitted into the space, so as to close the entire cavity except a small opening in the crown through which the application can be made and sealed in. If the tooth is too isolated to treat in this manner, a shell crown can be formed of thin sheet gutta-percha; slipped over the tooth, and a hole made through it, for introducing the application.

About Engine Burs.—Many members of our profession are in the habit of buying their supplies and instruments in too small quantities; which is a very uneconomical way of conducting business. Take for instance, the item of engine burs; they are usually bought of the nearest dental depot, in small lots of one or two dozen at a time, at a cost of about \$2.25 per dozen; while if ordered in gross lots, a first class bur can be had at a big reduction per gross. When ordering from the manufacturer, be particular in specifying exactly what is wanted, keep a copy of the order; when the goods come, if not according to order, or up to standard in quality, return the defective ones and you will probably have no further trouble in getting what you order. After receiving a nice stock of burs, the next thing is to take proper care of them; they should be kept clean, free from rust, and out of the sunlight. They should be put away in cases so arranged that selections can be made without having to handle over the whole stock.

(Here is a bur case of my own design, that I find quite handy).

When operating, a bur should never be laid aside until it is cleaned; this will prevent the lips from rusting, which will soon destroy the bur. At the trifling cost of each, there is no excuse for torturing a patient by using dull burs; and, that obtundent has never been discovered that can make excavating painless with a slowly revolved, poorly made, dull bur, under pressure, in a flooded cavity. While, on the other hand, the majority of teeth can be excavated with but little or no pain, by using good sharp burs, run at a high speed, handled with a light intermittent touch, the cavity being kept absolutely dry.

Cracked Plates.—We often have trouble with upper plates cracking, or breaking entirely in two, along the median line. When this accident occurs, the plate is sent to the dentist who usually repairs the break, and returns the plate, without seeing the patient; only to have it sent back in a few months, (or go to some other dentist) broken again in the same place. Some prac-

titioners, try to remedy the difficulty by making the plate thicker, or by putting in a metal stiffener, which only bridges over the trouble a little longer, as none of these methods reach the cause. To more fully give my idea of this trouble, and the proper remedy, I will cite a case in practice. Mr. M—, came into our office early one morning last fall, and removing the cover from a little paste board box that he carried, he took therefrom the broken sections of one of these old chronics; and placed them carefully in my hand, remarking "I have had that plate mended twice a year for the past five years, and I have got so accustomed to it that I expect to pay the semi-annual dental assessment, with as much regularity as I do my taxes." I inquired if the plate was a good fit, and he replied, "Oh yes, it is a nice fit, and very comfortable; I want you to be real careful and not alter the shape in repairing." Noticing that he had a bump of firmness on top of his head, about the size of a goose egg, I knew that there would be little use to argue the case with him.

I took an impression of his mouth, made a cast, put the old plate on, and showed it to him; he had no further objections to offer, against our making a new plate. The old one did not touch the alveolar ridge on the plaster cast anywhere; and in some places, cleared it nearly the sixteenth of an inch. This is very often the cause of these breaks, and it is a useless waste of time, material, and reputation, to repair them. When a break of this kind is sent to our office for repair, I am always reminded of the street urchin's reply to the poet Pope.

Alexander Pope, who was a deformed cripple, had a habit, when irritated, of saying, "God mend me." One day, when passing along the street, a boy begged some money. Pope answered angrily, with his favorite exclamation. The boy, cocking his head on one side, eyed his shrunken body, and exclaimed, "It would be a good deal easier to make a new man."

RIGGS' DISEASE; OR, "WHAT YOU WILL." *

BY J. E. CRAVENS, D.D.S., INDIANAPOLIS, IND.

"What's in a name? That which we call a rose
By any other name would smell as sweet;
So Romeo would, were he not Romeo call'd
Retain that dear perfection which he owes
Without that title."—(JULIET.)

It would seem that a name should be first a designation, later possibly, a definition, or in emergency a description. It is possible for a name to express too much. There was a time when a particular lesion, presenting certain diagnostic elements was generally known to dentists as *Riggs' disease*. Just what the proper name for that disease now is would be difficult, if not hazardous, to mention before this association. However, this one fact holds good against all mutations of discussion as to etiology, pathology, and endless suggestions of endless names, in this, that the disease under consideration continues to exhibit pus that exudes or may be expressed from one or more aspects of an alveolus that has been enlarged by—what? Certainly not by pus; for who can assuredly declare that pus destroys bone? Lining the concave wall of bone that forms the greater limit of a "pocket" of Riggs' disease, or pyorrhœa alveolaris, etc., there is a sort of cushion of soft tissue, apparently highly vascular and protected by the socket periosteum, an arrangement that effectually prevents pus or any other of the contents of a "pocket" coming in direct contact with the alveolar bone. Truly, pus may bathe the involved portion of a root indefinitely, but does not destroy it. In the history of Riggs' disease (or if by any other name this rose of ours may bear a sweeter odor, let it be so called), the only tissue really destroyed is alveolar process. But how? Realizing that a reasonable doubt as to adequate authority for some statements made in this paper, may exist in the minds of some auditors, and claiming for myself a desire to induce others to careful study of all aspects of this subject so important to dentists and their clients, I beg leave to offer some quotations from the Reference Hand-Book of the Medical Sciences, pp. 381 to 385 inclusive, viz: (Authorship

* Read before the Mississippi Valley Dental Society, April, 1895.

of Dr. R. H. M. Dawbarn). "Inflammation of a bone may be induced by simple traumatism, by extension from a periostitis, by extension from arthritis; by exposure to cold, or to action of certain poisons, as phosphorus, mercury, syphilis; by pressure; by eruptive fevers, typhoid—possibly acting as a primary and certainly as a predisposing cause."

"It is of little clinical value to classify inflammations of bone, from an anatomical standpoint, into osteitis, osteomyelitis and periostitis, since primary periostitis, with exception of the traumatic and syphilitic varieties, is very rarely observed."

"Periostitis may originate from traumatism either simple or compound, and in character may be simple (that is aseptic) or septic, from the presence of micro-organisms."

"Chronic, non-infective periostitis may be either fibrous or ossifying. In the former (fibrous) there is much increase in the amount of connective tissue, and the thickened membrane adheres unusually close to the bone; in the latter (the ossifying) we have as a result an ossific deposit."

In the preceding quotations we have facts that appear to me to exactly fit the conditions manifested in pyorrhœa alveolaris; there prevails at first in the socket an inflammation of a "chronic, non-infective" character, that involves the periosteum and destroys the bone of the alveolus; later, under certain conditions, brought on by the surgical act, and supported by intelligent secondary treatment the character of the inflammation of the periosteal membrane is caused to change from the "fibrous" and destructive to the "ossifying," which I hold to be an *acute* stage, and "we have as a result an ossific deposit." Dr. Dawbarn says further, "The new bone of inflammatory origin is not deposited in regular systems of lamellæ, probably owing to faulty nutrition, and it is sometimes absorbed and disappears."

I hold that the pathology here given applies directly to Riggs' disease, that by the same anatomical element, namely, the "thickened membrane," or what later is referred to by the same authority as a "granulation tissue," the spongy structure of the bony septæ is destroyed; and that after proper surgical procedure the "chronic" or "fibrous" is succeeded by the acute form, that accomplishes an "ossific deposit" differing from the true alveolar bone in that it is but a *bone eschar*. Thus it is that failure may occur from a constitutional tendency to revert to the

"fibrous" form, and the new deposit may be re-absorbed, and pyorrhœa alveolaris reasserted. This last is failure.

Observation of cures of this disease, under my own hand and peculiar method of treatment, leads to the conclusion that if development of new bony structure proceeds until the "pockets" are filled and so obliterated, and the new tissue shall be closely adapted about the roots (which it will be if there at all), there will be no return of the disease, no recurrent absorbent action, even in cases that have been only partially filled in with this new "ossific deposit."

The author here quoted says further that the products of chronic periostitis are *pus*, *fibrine* and *serum*; these elements principally form the constituents of the fluid contents of pyorrhœa "pockets." Quoting still further, we have "in periostitis and rarefying osteitis, the absorption of bone is thought by some pathologists to be caused by the presence of certain large, multinucleated cells, the myeloplaxes of Robin—called from this idea, osteoclasts.

Other pathologists disbelieve that these large cells possess any such power, and attribute the absorption to the influence of the new granulation tissue present in such cases, and lying in contact with the bone. I have already mentioned this new granulation mass or tissue and first referred to it as a vascular cushion or tissue that lined the greater diameter of a pyorrhœa "pocket" where it accomplished destruction of alveolar bone.

Dr. Dawbarn further says, "It is thought that the granulations (granulation mass) evolve an acid. Formerly it was believed that lactic acid was the solvent. Till man's later researches seem to show that it is the carbonic acid contained in the blood which dissolves bone tissue."

In another place the author quoted says that sometimes no cause whatever can be assigned for periostitis; so it often is in Riggs' disease, that the cause or origin in a particular case cannot be discovered or intelligently conjectured.

A significant point to all that I have quoted, and all I have read without quoting, on this subject, is that no mention is made of destruction of bone by pus.

The summing of my observations is that *Riggs' disease, per se, is a periostitis of a "fibrous" character*, which Dr. Dawbarn has further described by the terms "chronic" and "non-infective."

tive." That this character of periostitis is destructive to bone and accounts to the dentist for the "pocket" that formerly bore so mysterious an aspect. Doubtless it is differentiated from that which occurs upon long bones or other parts of the skeleton, or under muscular tissue anywhere, because this peculiar lesion occurs within the dental alveolus, within an articulation that is practically fixed although without ligaments.

Given an instrument sufficiently delicate and of proper shape for manipulating within these "pockets," and fingers in which sense of touch has been cultivated, and the velvety response of the cushion of "granulation tissue," that always lines these "pockets," may be readily detected.

In operating for cure of Riggs' disease, this "new granulation tissue" must be lacerated, for the purpose of inducing a radical *change from the chronic to the acute inflammation* of the socket periosteum, from which alone there is possibility and hope of securing the new "ossific deposit" that assures a cure. But in a "pocket" operation the complete removal of pyonal calculus and thickened and folded pericementum should be first accomplished, in order that the annoyance and serious inconvenience of certain hemorrhage may be avoided. The union of new bone with the root may be something analogous to ankylosis, or it may result in a true articulation similar to symphysis of the sections of the superior maxillæ. I am inclined to the latter opinion, because often the roots remain too loose for an ankylosis, long after every symptom of disease has disappeared.

A "pocket" and its contained pus, fibrine and serum, are simply results of the chronic periostitis of the alveolus, just as the calculus discovered on the root is a result deposited from pus; in all cases the periostitis of the socket must have an external origin. The most absurd of all the vagaries advanced as to the etiology of Riggs' disease or pyorrhœa alveolaris, is that it has an internal origin and begins at or near the apex of the root. It is always a pleasant thing to contemplate ourselves as specialists in medicine and surgery, with perhaps a dash of fine art and delicate mechanics, but our greatest danger lies in a possibility of becoming too highly medicated, too intensely scientific; this tendency leads away from a plain contemplation of the mechanical and physiological aspects of the disease under consideration. I have observed that a "pocket" may extend to and entirely

around the apex of a root, after traversing its entire length, and far beyond the remotest deposit of pyonal calculus, and there be no external evidences of the existence of such a "pocket" nor entrance discoverable to it, save and except that peculiar bluish-red color of gum characteristic, and the sense of an indescribable uneasiness felt by the patient; that the lesion may persist even after removal of all discoverable pyonal calculus from the root, and most careful antiseptization of the case; and that constitutional treatment fails to check the ravages of the destroyer.

So far as I have been able to discover, the pericementum has little or nothing to do with Riggs' disease, except possibly to be affected by it and thus add an annoyance. It is doubtful that the pyonal calculus ever is really deposited upon pericementum, because a dead pericementum in the socket is impossible in a living subject, and the live membrane disappears as the calculus encroaches. The calculus being a result of the disease, may accumulate at a point rather remote from the cervix of the tooth, but there will be no pericementum left between the calculus and the entrance to the socket on that aspect of the root. The periostitis always is extended from an external origin or cause, such as an orbicular periostitis about the orifice of the alveolus, underlying a severe case of gingivitis; or an injury to the deeper membrane by dam-clamps, or badly adjusted apparatus for regulating teeth; ill-fitting crowns, independent or attached to bridge-cases; long protracted ligating at cervix; or, from traumatic injuries immediately about the socket, from any cause—as simple a thing as a splinter from a wooden pick thrust into the tissue of the gum—a frequent occurrence. Often the injury that sets up a periostitis is due to a careless manipulation of dental instruments; and as Dr. Dawbarn says of perisostitis in general, the origin of Riggs' disease can not always be determined.

I believe that pyorrhea alveolaris is not contagious; Dawbarn says that "chronic" periostitis is "non-infective," this socket lesion is not a heredity, although conditions *may* be that tend to favor its establishment ultimately, and yet the disease may never obtain. It is not constitutional, and constitutional treatment does not facilitate its cure any more than it does the removal of an ingrown toe-nail; it is not always symmetrical; it is not confined to adults, but as early as fifteen years has presented most stubborn resistance to treatment; while it may be associated with

gout in Europe in many instances, in the United States it certainly is not the case, else the arthritis is most successfully concealed. This point has been already answered by Dr. A. W. Harlan, who declared that in this country gout is almost unknown. Riggs' disease is often associated with affections of the Schneiderian membrane, but prevails unaltered after that membrane has returned to a state of health. It certainly is true in the United States that a majority of victims of pyorrhea alveolaris are also afflicted with nasal catarrh; but it could scarcely escape such association in a country where the catarrh is almost a badge of nationality.

Riggs' disease is most difficult to overcome in incipency, that is, that condition just beyond gingivitis, where pockets are just beginning or hardly begun; in such cases the lesion consists in an orbicular periostitis, the operation for which was first described by Dr. A. W. Harlan, consisting in scraping the periosteum from the bone, if rough; for which Dr. Harlan designed a pair of right and left chisels that still are the best adapted instruments for this purpose. I have found pyorrhea alveolaris most easily cured in middle life, and always more satisfactorily treated where the "pockets" were fairly well formed.

VERY DEEP "POCKETS" ARE NOT READILY DEALT WITH.

Probably there was written during the last two years, on this general subject of pyorrhea alveolaris, more than had been during a decade before. I was about the first to begin the season of activity in campaign against this disease, which I did in a report of a case in practice before the American Dental Association, August, 1893, at Niagara Falls, N. Y., wherein was given all details of treatment of a case of nineteen pus "pockets" which I there declared to be cured, the treatment having all transpired during the month of July preceding. It was not to be expected that my statement would be accepted, and in that I was not disappointed; with exception of Dr. Harlan, I believe every voice was against me there; the general opinion was that the case was not cured, and that I was deceived by appearances; others were blunt enough to declare that it had not been a case of pyorrhea alveolaris at all; one gentleman would accept no diagnosis that was not backed by analysis of urine of the patient. But I am used to that sort of argument and courtesy, and so sur-

vived to examine that case again in August, 1893, and found that there had been no return of the disease at any of the nineteen points treated the preceding year. I examined this case again in September, 1894, and still all was well with the places treated. Two years ought to be a fair test of treatment.

At the close of 1893, Prof. C. N. Peirce, of Philadelphia, proclaimed the gouty character of pyorrhea alveolaris, ascribing it to presence of uric acid in the blood, and claiming in proof of this connection that uric acid was to be found in the calculus of this disease. While not prepared to admit all that Prof. Peirce has written on this subject, and yet not prepared to deny, I trust not to do an injustice to one whom I have long esteemed, and so will express no opinion on the uric acid and other propositions advanced.

The first paper by Dr. Peirce, called forth an avalanche in response, which appeared in the *International Dental Practitioner* early in 1894, and impelled the editor of the *Western Dental Journal* to remark "Here we come, head us off, dad gast our fool souls!" or words to that effect. Not the least amusing aspect of this remark by the editor mentioned, was the fact that only a few years before he appeared in the American Dental Association proceedings arguing that pyorrhea alveolaris is catarrhal. He has maintained a silence for some time, which I regard as ominous.

The discussion of the etiology of Riggs' disease might go on for another century, and all cases of the disease might be lost during the grand discussion from the loftiest planes. I hold that *one case cured* is better than a thousand essays and speeches upon the possible or probable causes of a disease that has been robbing poor humanity of good sound teeth, probably ever since the Ark rested on Mount Ararat. Of all the half score responses to Dr. Peirce's essay, only one suggested practical measures for the cure of the lesion.

In 1894, I had the temerity to write and have published a book, partly for the gratifying of "mine enemy" but principally in a hope that many other brother practitioners would avail themselves of that system which had been so universally successful under my hand, in curing Riggs' disease. I still pursue this system with success, as a long list of grateful patients will attest. There are "none so blind as those who refuse to see." In

Walter Scott's story of "Robert, Count of Paris," a character is brought to the light of day, from the cells under the Blachernal Palace where he had been confined in total darkness; the poor prisoner for three days insisted that he could not see, and at last was induced to open his eyes and try; much to his surprise he could see. He had refused for three days to open his eyes.

DISCUSSION.

DR. A. W. HARLAN, Chicago: I am sorry I did not get in early enough to hear the beginning of Dr. Cravens' paper; I thought that it would not come off until to-morrow morning. Before I came down here Dr. Cravens sent me a brief synopsis of the paper, which will probably furnish me with that portion I did not hear.

The consideration of the etiology of the so-called Riggs' disease is a question that should concern every dental practitioner, because in nearly every locality in the United States we have loosening and loosened teeth. In that category we will not include the teeth that are loosened by the mechanical friction of plates and clasps, or regulating appliances, but teeth that become loose from causes within the mouth, at least not mechanical. In the first part of the discussion of this paper I am unable to see how there can be a production of pus in any locality in the body without the presence of micro-organisms. The author, I think, denies the production of pus from micro-organisms. He says that periostitis causes it; well, I don't consider that Dawbarn is very good authority on that point myself. The experiments that were made some years ago by Harmon Knapp and his collaborators showed that the introduction of various irritating agents beneath the skin in sealed glass tubes and bulbs, when introduced under the greatest antiseptic precautions, and the bulbs afterwards crushed beneath the enclosed skin, that in not a single instance was pus produced, nor could the pus microbes be discovered in the serous exudates found in those cavities on opening them either at the beginning of the process or at a later period.

The conclusions that were arrived at by Knapp and his collaborators at that time, to this day have not been disproven; and this I conclude, considering the large number of workers in bacteriology in the various departments of medicine and surgery, indicates that the scientific world has accepted this experiment as

conclusive, up to the present time. The paper of Dr. Peirce and his school has been very violently assailed by Dr. George S. Allan and some other writers, with chemical analysis to show that uric acid was not found in the calculus that was taken from, or near, the apices of the roots of the teeth. So that, it seems to me, is still an open question. One chemist in Philadelphia found some urates, I think, and the chemist in New York did not find any. Consequently either the calculus was not the same, or one or the other of the gentlemen erred in making the calculations. As a matter of fact, and in this respect I agree with Dr. Cravens, we find the so-called Riggs' disease at almost any age. He states in his paper that at fifteen years of age and upwards he has found it. I recorded one case about four years ago where I found the disease as early as the ninth year. I never saw but that one; but it was distinctly the so-called "Riggs' disease" pocket, and I called attention to it at that time. The trouble about the discussion of this whole question lies in this particular: we find teeth that are loosened and loosening, with deposits on the sides of the roots, and sometimes deposits covering the apices of the roots, say two roots of the molars with the third untouched. We find deposits over the apex of a single tooth and a pocket, and the teeth not perceptibly loose; and in other cases we find something that is founded on so-called "Riggs' disease," where there are absolutely no deposits on the roots of the teeth,—and still the teeth are loosened, and when the finger is pressed on the gum, from the apex down to the gingival margin we find a discharge of pus. It seems to me that we should restrict the classification of this disease and make what we would call "Riggs disease," a disease where there is always a deposit on the root of the teeth, or else confine it to where there is no deposit, but where the gum and periosteum are separated from the root. These two phases should be differentiated, because in the latter case it is hardly possible that the character of the pus that is produced through the agency of micro-organisms would completely denude the root of the tooth of a previous deposit of calculus. Is there any variety of pus so acrid in its nature that it will separate such a deposit from the root of a tooth? I, at least, have never discovered such a character of pus. Taking then, that phase of the disease where there are deposits on the roots of the teeth, the question before us is, what produces this deposit? Is it of constitutional, or local origin?

I will try and answer the last part of it first. If it is of constitutional origin why does it not deposit on the roots of all the teeth uniformly in the same mouth? If it is a truly constitutional disorder why do we find that there may be a first bi-cuspid with deposits, and then a second molar and a second bi-cuspid and the first molar entirely free? I do not know that it is absolutely proof positive that it is of constitutional origin, yet you see hundreds of cases where a so-called "Riggs' disease" has attacked a tooth, and you find two teeth, or three, or four on one side of the mouth, or all the teeth in position, not loosened or loosening, and the teeth on the other side perfectly free. Have you not seen such cases? After reading the paper of A. Witzel of Essen, Germany, in 1881, on what he calls infectious alveolitis, have been strongly of the opinion that the so-called "Riggs' disease" was a disease of local origin, but that constitutional complications might exist which would enable or permit this disease to progress more rapidly and be coincident with it. This is not impossible; but with the inception of the disease, as a disease it seems to me that there is no evidence to support the theory in spite of all the papers of Magitot, Miller, Peirce, Galippe, and others—in spite of all the papers, *pro.* and *con.*, that there is no evidence to prove that it is a disease of strictly constitutional origin; but that it must have some external agencies to begin with, no matter whether they be from the effects of a clamp, or a pair of forceps misapplied, or an unskillful operation around the tooth, that it must be local.

In the next place, Dr. Cravens, as I understand it, says that it is not infectious. Now, a gentleman who stands very high in the bacteriological world, whose name you would recognize as deserving of that high position that he holds, if I mentioned it, communicated to me in confidence a case of infection that he brought about purposely to determine the effect in the mouth. He said that he did not wish to have this published at the time, because he was not sure of it; but, later, after the tooth was lost through the infection he told me that he was satisfied that it was infectious; and he still claims that it is infectious. He claimed that the introduction of an instrument that was bathed in the pus from a "pocket" of this kind, if used on a sound gingival margin or beneath it, would carry the disease in this mouth from this pocket to another, as he had seen a case where the teeth had been thus lost.

If I am not mistaken, Witzel also inoculated one or two or more dogs—I think I am not mistaken in that,—to prove the infectiousness of it. Now, if we accept the theory that pus cannot be produced without the agency of micro-organisms, we must accept the theory that the so-called “Riggs’ disease” is infectious; otherwise the first part of the theory would be useless.

The next question would be, if a nidus were formed around the root of the tooth for the collection of the spores of the pus microbe, naturally the destruction of the peridental membrane would be first, and secondarily the destruction of the alveolar socket would ensue, and thirdly, the production of the deposit would result; that is, the three processes are, first the peridental membrane destroyed the pericementum; second the bony socket contiguous; third the deposit from the serum, sanguinary or pyonal, as Dr. Cravens calls it. Now the mere deposition of granules of this sort of calculus being merely mechanical is not sufficient in itself to produce pus, because we deny that pus is produced without the agency of micro-organisms. Second, the chemical constituents of deposits found on the roots of teeth under such circumstances are found to be different from the ordinary salivary calculus, because it is wanting in certain constituents that are found in the ordinary salivary calculus, as we find it. Another proof of the fact that it is not of salivary origin is this: that beyond the line of detachment of deposition of salivary calculus you will never find a peridental membrane receded from the root, and soon as you dislodge the salivary calculus from the root of a tooth down to the extreme point of its deposition you won’t find any pus corpuscles, or pus microbes; because if you did find them there would be a detachment beyond that would be a nest for future proliferation of developed microbes, which would destroy the peridental membrane. We don’t find the peridental membrane destroyed beyond this mechanical deposition of salivary calculus. It is deposited on the roots frequently after the peridental membrane has been destroyed by the so-called “Riggs’ disease,” and then we find salivary calculus on the roots of such teeth but in a case of that kind it is just as though you could run a white-wash brush over the side of the root, and it leaves it ragged and irregular, in granules, there being no membrane around the root to jut up against it; the membrane does not extend to and around the apex of the root, except in exceptional instances.

The destruction of the bony socket of the teeth may be accomplished through the ichorous nature of the pus, produced by a certain micro organism called the micrococcus pyogenes citreus. It is possible to produce the death of the bone surrounding the root of a tooth, and a number of observers have found that it was necrotic tissue, and that it was an organism that could be isolated from the pus. There are some teeth, where the apices of the roots have been uncovered through the proliferation of the so-called "Riggs' disease" and we find that the pulp dies in consequence, and that the root of the tooth assumes a bluish-black hue, and that the cementum on the roots of such teeth appears to be totally devoid of any semblance of vitality. This is only in extreme cases; and the question in my mind would be, in differentiating, whether that cementum was destroyed in consequence of the presence of the pus, or whether it acquired that character from the destruction of pulp. That I have not been able to determine. I should be inclined to the belief that the vitality of the cementum was lost simply on account of the destruction of the pulp, after the peridental membrane was stripped from it. Dr. Cravens says that pyonal calculus is a result of the disease; I am perfectly willing to agree with that, because as I view it, as I have stated it, it must be the result of the disease; and I differentiate it from salivary calculus, as I have previously stated; and I say that it is the third step in the natural history of the disease, if left alone.

I don't know that I am called upon to say anything about the treatment of this, as I believe it is simply the etiology we are now considering, and we will leave the treatment alone. I will only say this, that if it were a constitutional disease we would cure it by simply removing the mechanical difficulties in the way and then administering our remedies constitutionally and the case would get well. But cases don't get well without local applications. If the man is suffering from some grave disorder that requires the administration of remedies, why, that could be carried on at the same time; but the administration of the remedies, except for the toning up of the general system, will not affect the cure in these cases without the application of local remedial agents, whatever they may be.

DR. J. S. CASSIDY, of Covington: I do not think I have such pronounced views upon the nature of "Riggs' disease" as to be

unable to agree with many of the points made by those who argue *pro* and *con.*, especially some of those made by our excellent friend Dr. Cravens, in his excellent paper. As Dr. Harlan says, there are cases and cases of this disease, and that all which are diagnosed as "Riggs' disease" are not truly genuine "Riggs' disease," or pyorrhea alveolaris. Ever since Dr. Ingersoll suggested sanguinal calculus, or sanguinary calculus, near the apex of the root, as the possible incipient stage of this disease, I have had an opinion that such was the case—that the disease was a local reflection of at least a constitutional predisposition to it. Now, while at this point, I would say that Dr. Harlan asks, if this disease be constitutional, why all the teeth are not similarly involved? It is because, I think, if it be constitutional, that the conditions—the local conditions—in each tooth are not alike; that there is a law of periodicity, which applies to this as to most other things, all other phases of matter, animate or inanimate—a periodic law. That might be, for instance, I will not say proven, but as tending to the idea that there is such a law—instanced in this: Why will a bi-cuspid withstand the destructive processes when its neighbors on either side of it have been destroyed? Why has it stood sound, alone, for so many years? And its mate on the other side of the mouth, say, first or second bicuspid, or any other tooth, if it has a mate, been destroyed. Those two teeth remain sound and free from disease until a certain period of life, nine years, which is the extreme limit of this disease (Riggs' disease), I believe, to appear, or seventy-five years, as the case may be; then disease appears, caries of the surface of the bicuspid, we will suppose, and it appears almost simultaneously in an analogous position on its mate. Now, why are those teeth persistently well so long, while all their neighbors have gone? Simply because, according to this view, there is a periodic law to regulate these matters, as well as local influences. I have regarded this disease, called pyorrhea alveolaris, as a constitutional or as a local reflection of a constitutional cause; and I say that ever since the statement of Dr. Ingersoll, about ten years ago, of sanguinary deposition on the roots of the teeth, that I have regarded this disease as due, primarily, to those deposits. They are too minute for us to discover, even if we extracted the tooth in the beginning; too minute to discover, but yet of a sufficiently irritating nature to produce inflammation and its train of symp-

toms and the troubles that follow, and which have defied the best efforts of therapeutics to overcome. Now, what is the solvent of that? Is the alveolus involved? I don't know. It might be, as Dr. Harlan suggested, a deteriorated pus—not pus by itself, but deteriorated. I cannot conceive of pus alone causing the deposit, and agree with the essayist in that respect. I cannot agree with the essayist, however, that the calculus is pyonal, that it is caused by pus—cannot call it by that name. He gives it that name. Why? There is no reason why it should be given that name. I do not think it can be called, properly speaking, pyonal pus. Pus is a consequence of the destruction of the disease itself. Micro-organisms, of course, must be present as a consequence of the disease, a catabolism instead of a metabolism; and why nature should attack the alveolus instead of the root of the tooth, is because, I presume, it finds the alveolus more susceptible to attack, more easily destroyed than the root itself; but if the root be extracted the disease is cured. My own opinion is that a genuine case of Riggs' disease cannot be cured in any other way.

DR. HUNTER: Our friend the essayist has given us a very plausible theory. I have had the pleasure, recently, of reading his little book that he refers to in which there is a beautiful theory advanced, and in some respects a plausible theory. (Laughter). One of the plausible points of the theory is just in my mind what Dr. Cassidy objects to—pyonal calculus. He demonstrates in that book by analysis, and giving the authorities, that pus contains a greater proportion of lime salts than saliva; and he says in the book the wonder is, not that there is so much deposit from the pus as that there should be so little. To my mind that seems plausible. The constituents of pus, as far as the lime salts are concerned, are very much greater than that of saliva; but Dr. Cravens is very enthusiastic; he gives us theories; he has given us a theory before. There are many of us here that remember how enthusiastically he advocated the theory some years ago of nature appropriating from the topical application of oxy-phosphate of lime material for making phosphate of bone. I believe he has given up that theory. I hope that his present theory will stand the test of time better than that did. In his treatment by mechanical manipulation he is certainly more thorough than the majority of us are; and we do know that in the treatment of this disease that the more thorough the treatment the more good we

do the patient; but in my own mind I doubt very much if the removal of the result of the disease is going to effect a cure. You must get at the cause of that disease. We are endeavoring to do it, and the theories advanced by the essayists and others are all tending in the direction of discovering the cause of this disease. We need such enthusiastic observers in the investigation of any subject. The doctor's hair is a little thin on top; but it is of a good color! (Laughter). I hope that his theories will stand the test of time. He claims to have produced cures by simple mechanical manipulation that the rest of us have been unable to do. In that book he speaks of a thorough removal of this calculus; and anything short of that is only a temporary success; or as he expresses it, a partial failure, I believe. (DR. CRAVENS: Modified failure). Well, I am willing to admit that I have only made modified failures in all of my experiences. I cannot cure this disease; and I believe that the evidence is sufficient, from what the essayist says, that it is hereditary, or that heredity is the predisposing cause. I have seen too much of that in my own family—in myself. I have the disease in my own mouth, and I know a little about it practically; but cannot cure it. I guess I will put myself under the care of Dr. Cravens. (Laughter.)

DR. O. N. HEISE: I did not have the pleasure of hearing the paper, but from the synopsis sent me I cannot help, but agree with the main points, except that it is periostitis, and he does not say how that is produced; he simply makes that rash statement without saying what grounds he has for it; I wish he would make some explanation of that.

DR. CRAVENS: Did you hear the paper?

DR. HEISE: I did not. I simply judged from the synopsis you sent me. Not having heard the paper read I don't think I am able to say anything about it.

DR. WRIGHT: I don't know that I can say anything of interest on this subject at all. The one point of the infectiousness of "Riggs' disease" I want to speak of is a matter of history. Thirty or thirty-five years ago, in Dr. — office when we had the first case, we did not know anything about it, that is, the simple loosening of the teeth that was present, and existed then, as now. We believed then in extracting those teeth, so that possibly the other teeth would not be lost, believing that it was

infectious from one tooth to the other in the same mouth. The disease used to spread; and we extracted the affected teeth for purpose of curing the disease. That was thirty-five years ago, and we don't do that now.

DR. CRAVENS: Dr. Harlan stated that I said the calculus was the result of the disease. I see a rather quizzical expression in Dr. Taft's eyes, as though he wondered why I should find it necessary to make such a statement. I will explain that I should not have thought it necessary to lay down that for the information of Dr. Harlan, in the paper, but I made that statement because I know there are many, perhaps the majority of dentists, who have the idea that calculus is the cause of the disease, so that I took the trouble to explain that the calculus is the result of the disease, and not the disease the result of the calculus. In regard to the infectious character of the disease, if it were infectious it seems to me that it would prevail generally in any mouth in which it had once obtained a foothold. It has only been a matter of ten days or two weeks since I had the opportunity to examine the lower molar of a gentleman that I had treated two years ago. It was the only case of pyorrhea in his mouth. I can not find a symptom of it now. He has pretty near a full complement of teeth. I met him on the street a few days ago, and as I was coming up here, I told him I would like to look at that tooth, and he came to the office and there was no sign of it anywhere else in his mouth. Now, Dr. Cassidy spoke of the calculus, and did not believe that I had any authority, or perhaps thought I was wrong, in holding that it was deposited from pus. I did not say it was caused by pus, but that it was deposited by the pus. Dr. Hunter came very nearly to answering that question; in fact, I think he did; but in his analysis did not give quite all of it, in his analysis from the book. It is shown by the authorities I quoted from, that the pus contains 300 % more of the elements of the calculus than the saliva. So that is why I used the remark that I did, that Dr. Hunter referred to—I mean as to the salts. The other constituents that come from the pus we do not expect to find in the saliva. As to the extent to which the disease is curable, of course Dr. Cassidy's remedy is older than Dr. Cassidy—perhaps older than the disease. I carried the disease back to Mt. Ararat, and would not like to go back further, because I believe some of our scientists claim our diseases have

altered now-a-days, because the solar rays did not come direct to the earth before the flood, on account of the constant canopy of clouds; the atmospheric conditions too were different, and the diseases before the flood were very much different. So I would not like to go back any further than the time when the Ark rested on Mt. Ararat, for the first case. In regard to inoculation, Dr. Harlan thinks some cases have been reported of that, and that there were evidences to prove that the disease could be transmitted by inoculation. I don't know anything about that. You may have pyorrhea on one side, a lower incisor say, and it will not affect the other side. I have treated such a case and cured it; there was no more pus, no more congestion; and it remained in that condition and the others remained unaffected. It is not symmetrical, and that is one thing that proves to me that it is not constitutional. If it was constitutional, why would it not be general? In very many cases it is isolated, one tooth here and there—not symmetrical.

LYCOPERDON FOR ALVEOLAR HEMORRHAGE.*

BY C. BREWSTER, L.D.S., MONTREAL.

I HAVE been requested this evening to address to you a few words on the subject of lycoperdon as a styptic for arresting alveolar hemorrhage. Like a great many other things, this material is *not* "new under the sun." It is a growth of nature, to whom we owe many of our best remedies, and is found in most countries. It is one species of a very large family, however; and though most of the different kinds of the lycoperdon are useful as styptics, there is one special kind that is better than all the others. It, however, takes considerable experience to discern the good from the indifferent. Lying in the fields for any great length of time, exposed to the various changes of atmosphere, it is subject to a certain deterioration which is only detected by careful examination. Fully a fourth of what I have had collected for me I have been obliged to throw away as useless.

As quinine in its own department—itsself one of Nature's own special remedies—stands pre-eminent for its curative powers over all competitors; so, too, lycoperdon will be found supreme in its

*Read at the Vermont State Dental Society, March, 1895.

curative powers over all other styptics for the arrest of alveolar hemorrhage. One of its peculiarities is its *healing power*. Plugging the alveolar cavity with any of the other known styptics, such as perchloride of iron, tannin and many other well-known remedies, too numerous to mention, is invariably followed, after the bleeding has been arrested, by much inflammation and severe pain. When, however, we use the lycoperdon for plugging the cavity, we find the very opposite effect is produced, the wound instead of presenting an angry, irritated appearance, and healing up very slowly, shows every inclination to heal by first intention, and not only that, but it shows a decided tendency to heal more rapidly than under ordinary circumstances. This can be easily proved by taking a case where two teeth have been extracted from the same mouth at the same time, and plugging one of them with lycoperdon and leaving the other to the usual process of nature. It will be found that the cavity that has been plugged will heal the faster. Fortunately alveolar hemorrhage is not of very frequent occurrence, but *unfortunately* it has a bad habit of springing itself on a dentist at the most unexpected times, and often when he is not prepared with the proper remedies to meet the case, his perchloride of iron has evaporated or looks as though it has gone bad, his tannin he can't find, and so on, and so on. Somehow these bleeding cases have a bad habit of coming on in the night or some other awkward time.

I have forgotten where I met the historical statement that when Cæsar landed in Britain the soldiers staunched their wounds with the puff-balls they found in the fields. In 1853, Dr. Benjamin Ward Johnson experimented with the form of fungus called lycoperdon giganteum, having been led to do so by witnessing its use to stupefy bees before robbing hives, a custom in use centuries ago in England. Dr. Richardson found that, exposed to heat, the fumes produced anesthesia, and from 1853 to 1860 he thus narcotized more than one thousand animals, also making himself unconscious by its use. He recommended its revival as a styptic in alveolar hemorrhage, but, for some reason unknown to me, it was not popularized. I am disposed to believe that it may have been due to the fact that the species of fungus with which he experimented, the lycoperdon giganteum, was not the best; and it is possible, too, that the decrease of the want of contractility in the blood-vessels, and especially of alveolar hemorrhage, due

to the more general use of fruits and better hygienic knowledge, made the matter of less importance to him that it was thirty years ago. There are still, however, very frequent cases of hemorrhage. In all cases of anæmia, where the fibrin is in inefficient solution, and the blood itself is of feeble coagulating power, the vascular trunk will have feeble, contractile power, and hemorrhage is apt to occur after tooth extraction.

Of course in marked hemorrhagic diathesis, or when excessive bleeding depends upon some previously existing disease, it is wise to avoid or defer surgical operations in the mouth, if possible. The regulation of diet and the constitutional precautions are outside the province of the dentist, and should be relegated to the family physician. However, when we meet with persistent hemorrhage in our office, one of the first things to do is to discover if the flowing blood is a blood that will coagulate. If a little is caught in a spoon, and the fibrin is seen to clot in three minutes, the vascular or mechanical cause will disappear of itself. But if the blood will not clot, we can rarely, if ever, fail by plugging the socket with lycoperdon. I have seen failures from perchloride of iron, tannin, and the other styptics of the pharmacopœia. I have known perchloride of iron to be used at the boiling point with no effect; and not long ago a case occurred in Montreal, one of spontaneous bleeding from the gums, in which no extraction had been performed, and notwithstanding the ligating of the carotid by one of our best surgeons, Dr. Roddick, the patient died.

Before passing altogether the anesthetic properties of this fungus, I may mention that some years ago experiments were performed in Montreal, by Dr. Beers, by placing kittens in a chamber, to the outer surface of which there was a small iron box perforated beneath, and having a pipe opening into the box above. After freely diffusing the fumes through the chamber, a kitten was put in. In six minutes it was insensible; remained thus for twenty minutes, having its ears clipped and otherwise treated without consciousness, and afterwards recovering and enjoying a good drink of milk.

If you inhale the lycoperdon through a hookah pipe, letting the fumes first pass through potash water, to clear them of carbonic acid, its effect is more lasting than chloroform. As a styptic in alveolar hemorrhage, its effect is instantaneous. By removing

anything in the way of thickened blood from the alveolar sockets, and opening the cellular tissue integument which invests them, bits of the fungus can be easily pressed with the finger and a piece of cork, spunk, lead or even cotton placed on top of it, and the jaws closed, and the patient kept quiet, cool and erect. It is wrong to let the patient lie down, or to give any alcoholic stimulant, as the object is to quiet the system.

I wish to draw attention to the fact that I have found the greatest virtue to lie in the lycoperdon bovista. The genus giganteum is the largest and easiest obtained; the bovista is small and scarce. The former is considered a distinct species, but the styptic properties of the bovista are much superior, containing a large proportion of phosphate of soda. It occurred to me to select the bovista, and medicate it with carbolic acid and camphor, by which means I have removed certain objections to it, and made it antiseptic as well as styptic.

I am indebted to Mr. Hoffman, of the Geological Survey of Canada, for assistance in obtaining the following analysis of the ash of bovista gigantea. Mr. T. Nettleford, F.C.S., England, who made the analysis, speaking of the peculiar stalkers fungi growing close to the ground, infers that they collect the mineral matter from the soil:

	Per cent.
Dry substance at 100 C. - -	8.35
Water - - - - -	91.65
Ash - - - - -	0.571
Ash on dry substance - - -	6.36

Analysis of the Ash. Calculated on plans calculated on residue.

	Per cent.	Per cent.
Resolute residue in hydrochloric acid	0.000	....
Alumim - - - - -	0.107	15.66
Magnesia - - - - -	0.000	2.03
Sulphuric acid ($H_2 So_4$) - - -	0.060	8.7ff
Silica (Sio_2) - - - - -	00.03	0.44
Sina (Cro.) mere traces - - -	....	....
Phosphate of soda - - - - -	0.381	72.18

It is noticeable that phosphate of soda was once largely used to arrest hemorrhage, and it appears that the styptic properties of the puff-ball is due to the excess of this substance.

A FEW NOTES ON DENTAL PROSTHETICS.*

BY S. GLOBENSKY, L.D.S., MONTREAL.

ALTHOUGH we must regard the necessity for artificial dentures as great a reproach to dental practice as the necessity for surgery is to the dental practitioner, yet we are forced to admit that prosthetics and surgery are indispensable, and that it is our duty to raise them to the highest possible perfection.

There are two sides to the question as to whether or not the introduction of vulcanite has been a curse to our profession. I am disposed to believe that students are made now in more haste than when artificial substitutes were confined to the more difficult bases of gold and platinum; and I am also disposed to believe that there is a much larger percentage of rude and unskillful work put into the mouths of patients. It is a bad sign of the times when cheapness is the chief object of attainment. We know that in all other branches of industrial art mere cheapness is followed by inferior production. Yet it must be recognized, on the other hand, that vulcanite has brought artificial substitutes more within the reach of the middling and the poorer classes; and yet for this very reason, I am disposed to believe that this has made them more indifferent to the preservation of the natural teeth.

However, we cannot escape the fact that the public demand this class of dentistry, and it occurs to me that I may be permitted to suggest a few points mainly directed to the treatment of the mouth before inserting sets.

First of all, I would ask your attention to those cases where the alveolus has undue prominence, sometimes so as to cause positive disfiguration, protrusion of the lips and excessive projection of the teeth. It is a well-known fact that after extraction and the usual absorption of the alveolus, extending over a year, there remains an ugly exhibition of structure, to which it is sometimes impossible, and at all times difficult, to adapt an artistic set that will conceal its own art. Especially is this true, whether we use plain or gum teeth. If it is impossible to use the latter, or elevate the lip under the nostril by pink vulcanite—which, of course, turns dark and is poor substitute for porcelain gum—then the

* Read before the Vermont State Dental Society, March, 1895.

depressions under and on each side of the nostrils, due to the removal of the long roots of the cuspids, make a permanent deformity. What shall we do in these cases?

1. As a rule, the cuspid roots are perhaps the most solidly fixed in the maxillary. As a rule, they can be easier treated for their preservation, because nature seems to resent their removal. I see no reason why it would not be wiser to excise than to extract their crowns, treat and fill them, and insert the set over the roots. As a rule, I think that the need for gum-teeth would not then be so urgent. Of course, to every rule there are exceptions. In case of such treatment, the patient should be instructed to have the roots examined once a year, for fear of elongation and bearing too much upon and weakening the plate.

2. There are very prominent protrusions which would be better treated surgically. After the teeth are extracted, and the gum-line and alveolus border still hang below the lip, there is no reason why the former may not be dissected from the alveolus, and the latter excised or cut down by forceps. In fact, the prospect of any undue protrusion after entire absorption can be effectually prevented by this precautionary surgery, and no possible injury inflicted upon the patient.

You will observe that I have not introduced any reference to the opportunities for crown and bridge work, as my object is to deal exclusively with the average demands upon the average practitioner and the means of the average patient.

3. It is not by any means a novel treatment to take an impression for a number of teeth before their extraction, cut them off the plaster model, set them up, and have them ready for insertion the moment they are extracted. But this has been largely limited to partial dentures. There is no reason why it may not be extended successfully for entire sets, if a good impression is secured, and the plaster teeth carefully cut from the model. It enables you also to replace the teeth, one by one, on the model, precisely in the position where nature puts them, and, after some experience, it will be easier to do this than to work upon the ragged plaster impression of wounded gaps, left after the forceps have been used. It will, too, be observed, that here again this is an advantage in the case of the extra prominent mouths of which I have spoken. It is a fact that a set made in such a way may be inserted a few minutes after the teeth are all extracted, and worn without alteration for four or five years.

4. I attribute most fractures of the alveolus to hasty and rough attempts to extract. Of course, there are cases of distortion of roots, of exostosis, of osseous union with the socket, which make the exception. But it is not difficult to learn, by previous examination, the condition of solidity of the teeth in the maxillary. In cases where this is very marked, it will follow that if the cuspids have to be extracted they will likely be the most difficult. Now, in order to avoid fractures, either of the teeth or of the processes, it is a wise precaution, if an anesthetic can be prolonged, to begin at the cuspids and rapidly follow to the others, especially the first and second molars, and firmly shake or twist these teeth. You see, the object is to loosen the pericementum, which instantaneously inflames, and within a minute the firmest tooth will much easier yield to the applied force of absolute extraction. It is a wrong principle to persist in tugging at an extremely difficult and solid tooth, risking its fracture and that of the surrounding alveolus. It is wiser to be slow and sure.

My attention has been drawn to these facts by observing a good deal of butchery in the human mouth, caused by ignorance and want of skill. Students get the idea that anyone can extract a tooth, and, for some curious reason, anyone seems at liberty in the United States and Canada to do so, whether they do it with a piece of cord or a pair of tongs, and no matter whether they break the tooth, the alveolus or the jaw! The result is that scientific surgery in this branch is rare, and as Heaven seems to take care of the fools who do not know enough to take care of themselves, much of this dental butchery has no serious result. On the other hand, the mouth is often disfigured for life. We find patients, who have been in those abattoirs, with splintered sockets, torn gums and lips or tongue, inflamed mucous membrane, and, instead of a uniformly healed ridge, one of depressions and deformity. For this reason, I do not favor the use, in cases where extraction is seen to be difficult and prolonged, of anesthetics which oblige us to hurry the operation.

ALL SORTS.

Devitalizing Paste.—When an arsenical preparation is used, a pledget of cotton as large as the bottle will accommodate should be placed in it and made to absorb the paste, and contain it in the meshes. A very small piece of this can be cut off and carried to position with ease and security.—*Dental Practitioner and Advertiser*.

Pyrozone Explosion.—We regret hearing of a serious accident to Mr. John Falls, an excellent druggist in the employ of Mr. Wilmot Hall, Cincinnati, caused by an explosion of pyrozone. This is the second serious accident in this city caused by explosions of this preparation. The drug is a dangerous one to handle, in consequence of which its use should be restricted to the narrowest possible limits.—*Lancet Clinic*.

Care in Vulcanizing when an Aluminum Plate is Made.—Dr. E. R. Johnson says: "A temperature of 350° will soften aluminum. Where vulcanizing is done at 320°, the inside of the vulcanizer will be at least 340°, and should the temperature of the vulcanizer run up a few degrees above 320°, as is often the case, the metal will come out soft. The vulcanizing should be done at 300° for an hour and thirty minutes."—*Extract Dental Practitioner and Advertiser*.

Sensitive Dentine Obtunder.—At a recent meeting of the Stomatological Club of San Francisco, Dr. M. W. Levkowitz made an exhibit of a saturated solution of potassium carbonate in glycerin for correcting sensitivity of the dentine. The following discussion, appearing in the *Pacific Coast Dentist*, seems to confirm the Doctor's claims:

DR. CLYDE PAYNE: I had occasion to use carbonate of potassium yesterday in a cavity of a cuspid; I could not even ligature on account of its sensitiveness. In a few minutes I applied the clamp and put on the rubber, then applying it again to the cavity I was enabled to excavate thoroughly, the patient claiming that it did not give her any pain at all.

DR. GIUSTI: I have used the preparation in two cases with marked success, both instances of very sensitive dentine, when in a few minutes much relief was obtained. Excavation was completed and the cavity filled without any considerable pain.

DR. LEYKOWICZ: I have used it because it was applied to one of my own teeth with great effect. I had suffered for nearly a year with this tooth, which was so sensitive at the cervix that anything sweet com-

ing in contact with it caused considerable pain. It was relieved by one application of the saturated solution of carbonate of potassium and glycerin, and I have had no recurrence of the trouble. I thought it an excellent remedy, and have had no occasion since to think otherwise. In the hope that it would be of service to you I have taken this opportunity to bring it to the notice of the Stomatological Club. I do not know the exact action of this preparation, but I will add that other remarks have just brought to mind the theory of Dr. James Truman, that the sensitivity in question is caused by acidity. If the carbonate of potassium acts as an antacid the glycerin dehydrating the dentine allows it to penetrate into the tooth substance.

DR. YOUNGER: I think Dr. Levkowicz has done us a great favor in presenting this remedy. Personally I feel that it is worth a great deal to me. I have used it in several cases where the dentine was exceedingly sensitive, and in each it has acted like a charm; however, I give it from seven to ten minutes so as to get the full effect.

Pain after Tooth Extraction.—Mr. Storer Bennett mentioned a case of prolonged and intense pain after the extraction of a tooth, due to an irritated nerve being exposed at the apex of the socket, which resisted all treatment until it was incised. In November last he was consulted by a lady aged 23, who was suffering from severe periostitis in the left upper wisdom tooth. A few days previously she had undergone an operation on the right side of the mouth, which was immediately followed by pains in the left upper wisdom, with inability to insert a plate which she had worn up to that time. The operation had been performed under an anesthetic, and the mouth kept open by a Wood's gag, which had been so unfortunately used as to dislocate the wisdom tooth on which it rested. He (Mr. Bennett) wished to venture on a word of warning in the use of this powerful instrument, which he had known to cause serious pain in many instances which had been credited to the dentist rather than to the anesthetist who had been the real offender. The tooth had to be removed, but the socket was intensely painful, and remained so for twelve days, no application affording any relief. In the meanwhile the socket granulated healthily, except at its apex, where a spot was discovered about the size of a pin's head, which looked white in color, in marked contrast to the red of its surroundings, and caused the greatest agony on being touched, no matter how lightly. Bearing in mind that John Hilton in his lectures described instances of ulcers and wounds which were very painful in consequence of the exposure of ends of nerves in the wounds, cases in which pain was stopped by the division of the nerve just below the surface of the wound, it occurred to him that this was a case of a similar nature. He therefore passed the blade of a

Paget's knife into the socket for about a quarter of an inch, and cut across the nerve, with the happiest result, for the pain instantly ceased, never to return.—*Journal Brit. Dental Asso.*

A New Operation for the Exsection of the Inferior Dental Nerve.—In a paper read before the Chicago Dental Society and published in the *Dental Review*, Dr. T. W. Brophy gave his method as follows:

“The operation which I have devised, practiced and which I recommend to my profession, in consequence of its simplicity and efficiency, was conceived by me while engaged in operating by the passage of a flexible silver probe into the canal. It occurred to me that the application of a flexible drill after the form of Gates' dental canal drill, entered at the mental foramen and carried backward to the inferior dental foramen, would thoroughly remove the contents of the canal.

The next patient who came under my care requiring such an operation, was operated upon in this manner. It became necessary, before the introduction of the drill at the mental foramen, to bevel a little of the bone at the foramen, by means of the dental or surgical engine so as to enable me to introduce a drill on a line with the canal. On examination of the bone it will be found that the canal makes a curve about one-half inch posterior to the mental foramen, and then gently curves upward as it passes back to the inferior dental foramen. The flexibility of the drill therefore, makes it very easy to traverse the canal and do it quickly.

Drills used for this purpose should be graduated and so constructed as to cut, as they pass along their course, after which, if the operator so desires, a broach of a large form constructed after the form of the Donaldson broach for the removal of the dental pulp, may be carried back in the canal, worked around, and any remnants of nerve tissue remaining can be thoroughly removed.

After the nerve is removed (which it is unnecessary to say should be attended with antiseptic precaution), the after treatment consists in antiseptic cleanliness.”

An Easy Method of Refitting Plates.—At a meeting of the New York Odontological Society, Dr. Davenport gave the following method for refitting plates. He said: Within the last week I have been so pleased over the accomplishment of something which I have not often done that I decided to speak of it here. A lady who had been for some years wearing a full upper denture recently consulted me because the plate would not keep its place while eating or talking. While the plate fitted accurately and had good suction when it was made, it has recently—the mouth being very soft—become exceedingly loose, and it seemed imperative at first to make a new plate, very much against the wish of

both the lady and myself, for the proper arrangement of the teeth in her case takes a great deal of time. As it happened she possessed a full upper rubber plate, which she had not worn a number of years, and the teeth upon that plate were entirely satisfactory to her in appearance, but of course the plate did not fit. I suggested experimenting with the old plate, to see if I could not so change it that it would answer her purpose without much expenditure of time. A plaster impression of the mouth was taken, the band of the plate was cut down almost to the teeth, and the entire centre cut out, so that nothing was left but sufficient rubber to hold the teeth in place. This being placed upon the plaster cast and waxed up as usual, was next tried in the mouth and slightly changed to obtain the correct articulation, after which it was finished in the usual way. The result was satisfactory, and the whole thing was accomplished with a very small expenditure of time. I thought it worth while to bring this to the attention of the society, because very often, with people over forty years of age, duplicate plates will accumulate, and often it may be possible to make those changes easy for patient and operator, and still bridge the patient over a number of years.—*From International Dental Journal.*

Pulp Protection.—In an article on this subject, in the *Dental Cosmos*, Dr. W. Storer How recommends a disk cut from rubber dam. He says:

“In a carious tooth the floor of the cavity sometimes has a place or point where the wall of the pulp-chamber or canal has but a thin septum between it and the cavity-floor, and the problem is one of pulp-protection from thermal shock or irritation. To the various well-known capping or non-conductive methods of procedure I desire to add an alternative one, which consists simply in the interposition of a disk of rubber-dam. The material is always at hand, and with proper punches suitable sizes of disks may be quickly made and kept in readiness. By folding a piece of dam in sextant shape, and with the scissors snipping off the point, an impromptu disk may be made to suit the case. For example, cut two such disks. Having the cavity formed and dried for filling, the cavity-floor and walls are to be lightly touched with a very little ball of cotton, carrying about a quarter of a drop of pure mastic varnish or other cavity lining. Then touching the cotton ball with the end of a curved canal broach, pick up the little disk and delicately cover the cavity floor, to which the disk will stick; mix some cement, suitably soft; put a little on the center of the second disk, lift it with a pair of fine-pointed foil-tweezers and gently place its cement side against the other disk, and with a ball burnisher softly spread the cement under the second disk to completely cover the cavity-floor and partly cover the cavity-walls. Allowing

some minutes for the setting of the cement, the remaining area of the cavity can be filled with whatever material may be preferred. The pulp will be doubly protected by the two rubber disks. The larger round disks may, with the scissors, be readily given oval or other shapes to suit special cases."

Compressed Air.—Regarding the use of compressed air in dentistry Dr. A. W. McCandless writes to the *Dental Digest* thus :

"Compressed air has lately come into use in the offices of a good many dentists, and after once becoming acquainted with its numerous virtues one would feel very much at a loss without it.

"I am so much pleased with it that I want to tell my brother dentists about it. It can be utilized by dentists very generally, as any town large enough to have water works or an electric light plant can furnish the necessary power. The water pressure is the less expensive of the two, as a motor is necessary to the equipment by electricity. For the former a beer pump is obtained and attached to the cold water supply and the waste. This may be placed in the laboratory under the sink out of the way and be also be connected with a thirty or forty gallon hot water boiler, such as is used at a kitchen range. This makes a reservoir of sufficient capacity to contain enough air to be used for a considerable length of time and in larger quantities than a pump would supply. The compressed air in combination with illuminating gas makes a beautiful flame for blow-pipe work, as the proportion of air and gas can be so nicely adjusted. Then as a chip blower at the chair it does away with the old-fashioned kind. The only objection heretofore being that the air being compressed and of a lower temperature than the atmosphere makes its use quite uncomfortable in a sensitive tooth, but I am very happy to be able to say that that objection has been done away with, as now I can heat the air to any temperature desired by electricity, and no matter if the air pressure is as high as sixty pounds it can be heated just as nicely as if the pressure were but five pounds.

Besides this, there are so many purposes for which this compressed air is useful that I advise everybody who can, to have it, and it is really an invaluable adjunct to the operating room and laboratory.

I might add that to the same wire that furnishes electricity to heat the air I have an electric mouth lamp and a root dryer attached.

The Use of Cements.—At a recent meeting of the Chicago Dental Society Dr. Fernandez said: "I keep on hand two colors of the powder only, the white and the gray, and produce the tints required, by intermixing with either color finely pulverized jewelers' enamel of the shade required.

This jewelers' enamel powder I prepare as follows: A lump of jewelers' enamel is enclosed in a piece of strong cloth and cracked down into dust with a hammer. This dust is then placed in an agate stone mortar, clean water is added and the dust is then ground into fine powder under water; next passed into an evaporating dish, dried by heat and bottled ready for use. In this manner I prepare any colors of enamel I wish to keep on hand.

When filling crown cavities with oxyphosphate I always burnish the enamel powder into the surface of the filling before it is perfectly hard, and this, I believe, prolongs its insolubility.

I believe it is a mistake to mix the cement too thick or too thin, and the spatula used for the purpose should be gilt or nickel-plated and kept perfectly clean.

Steel matrices should be avoided entirely. I use gold matrices exclusively in cement work.

I have noticed cement fillings in the approximal and distal surfaces of the teeth sometimes waste about the margin of the gum, and have found the following to be the cause: First, the cavity not properly cleaned at that part. Second, that part not being kept perfectly dry while filling; and Third, the patients neglecting the proper care of the mouth.

In regard to the use of cements for the purpose of lining large or deep cavities, I think it is invaluable. I would never recommend gutta-percha for lining cavities. Cement when used in crown- and bridge-work should not be mixed too thin, and in cases where the shape of the tooth to be crowned will not allow the thick cement to slide as it should and prevent the crown from going into place I have found it a good practice to cut V-shaped crevices lengthwise on the surface of the tooth. These crevices will allow the cement to slip by and thus overcome the difficulty."—*Extract Dental Review*.

Bleaching Teeth by Electricity.—The use of etherial solutions of pyrozone with electric current promises grand results in the bleaching of discolored teeth. In an article on this subject Dr. A. Westlake, in the *International Dental Journal*, says:

"The cataphoric effect of using pyrozone twenty-five per cent. solution in restoring the normal color of teeth in a few minutes is described in the following cases. The same appreciation of current, strength, and resistance must be considered as is used in cataphoresis on live dentine for cocainizing.

CASE NO. 1.—Mrs. A.—Nervo-bilious temperament; presented right inferior incisor very darkly discolored, a proximal cavity and incipi-

ent abscess. After carefully adjusting rubber involving teeth on both sides, I cleaned the cavity, opened the canal, and removed the pulp; I then passed a few shreds of cotton saturated with warm salt water in its place, after which I filled the cavity with pure absorbent cotton saturated with pyrozone twenty-five per cent. solution ethereal, and applied the positive pole galvanic current, in the shape of a needle, to the moist cotton, and placed the negative pole in the patient's right hand, repeating this three times as the cotton dried.

I commenced with four cells, and increased to about twelve cells, when the tooth began to appear white in patches about the neck and half-way up the crown; this half of the tooth soon presented a bleached condition in sharp contrast to the biting-edge. I then transferred the negative pole and made a short circuit through the upper part of the tooth, after having cut a narrow ridge through the enamel of the biting-edge. I then filled the root-canal and cavity, and the biting with gold. The tooth in other respects still retains a perfectly normal appearance.

This first experiment in cataphoresis for bleaching took place on Friday, March 8. The bleaching did not occupy more than ten minutes. The additional cataphoric effect on the periosteum and adjacent tissue was beneficial, as the tooth is perfectly comfortable at the present writing, three days after the operation.

CASE No. 2.—Miss T.—Nervo-sanguine temperament; left superior central incisor had been treated and an attempt made at bleaching the tooth by a dentist in New Jersey. I removed the gold filling, and found that the tooth presented a dark straw color. I applied the same method of application, but omitted cutting the biting edge. I found the cavity in this tooth much larger, but as the canal was filled with cement, the resistance was greater, and more current was necessary. I continued the application too long, and secured too great a bleaching effect. I filled the tooth temporarily with gutta-percha, but will blend the extremely-bleached appearance by inserting a lining of cement.

CASE No. 3.—Gentleman. Presenting superior lateral. The method and result were the same as in Case No. 1."

Coagulants and Non-Coagulants.—In a paper read before the First and Second District Dental Societies of New York and published in the *Dental Cosmos*, Dr. A. W. Harlan set forth his views regarding the self-limiting properties of coagulating agents when applied to pulpless teeth. After reviewing portions of the papers and experiments of Drs. Kirk and Truman, who hold opposite views regarding these agents, Dr. Harlan summarizes his own paper, as follows:

"First. True coagulators of serum-albumin are not diffusable when brought in contact with it in the tooth-root.

“Second. Coagulators of the organic matrix of a tooth-root, tube contents, (dentine), by the concretions of such albuminous matter prevent the further entrance of such coagulators as soon as their affinity for water is satisfied.

“Third. The destruction of a coagulum in such situations being a foregone conclusion through the agency of anaerobic microbes brings about a chemical change in a coagulant antiseptic which deprives it of the coagulant property; hence it passes into the circulation, and is excreted as other foreign inert bodies are discharged from different channels.

“Fourth. The addition of boroglycerid to a coagulant in definite proportions so alters it that it no longer acts as a coagulant; hence it is possible for it to pass through tooth-structure and be recovered from the liquid media surrounding a tooth, when its coagulating property will be restored.

“Fifth. Non-coagulants soluble in water diffuse readily through tooth-structure, as has been shown repeatedly in experiments out of the mouth, not only in egg-albumen, but likewise in serum-albumin.

“Sixth. Oleaginous non-coagulants pass through the structure of a tooth quite slowly in the presence of water in serum-albumin, and oils pass through filtering solutions, showing that they displace water. The vaporizable portion of an essential oil will give to a substance which it permeates the characteristic odor in from three to six hours (Watts).

“Seventh. A non-coagulant disinfectant destroys developed, and deprives the spores of anaerobic pathogenic microbes of the power to be developed; and, as it does not coagulate albumin, it does not prepare a food for the sustenance of any accidental ingress of such developed organisms; hence the future of such teeth treated by non-coagulants is infinitely preferable to the conditions surrounding those treated by coagulants.

“Eighth. A non-coagulant disinfectant completely sterilizes infected dentine by virtue of its diffusibility through it, while a coagulant either precipitates an insoluble barrier or so concretes the albuminous matter with which it comes in contact that it cannot act as a perfect sterilizer, but effectually seals infectious and poisonous matters in the dentine, which ultimately have their exit through the cementum and pericementum, depriving both structures of needed vitality.”

A New Method of Attaching Artificial Crowns to Badly Decayed Roots.—In an interesting article, on the above subject, appearing in the *Pacific Coast Dentist*, Dr. G. H. Chance says:

“A varied experience in this special line of practice has led me to believe that when it is desirable almost any badly decayed root may be

saved and crowned, provided there still remains enough sound dentine to securely hold one end of a small screw-post in place, presuming, of course, that the peridental surroundings are or can be restored to health; but, like all other somewhat complicated operations in the mouth, "haphazard" work will not do in such cases. The ground to be traversed must be carefully and intelligently studied, and each step toward the wished-for goal must be taken with due regard to the final outcome. . . .

"The case referred to was that of a gentleman of middle age, and the root to be treated and crowned was a right anterior bicuspid of the upper jaw. The case when first seen presented the following conditions: crown entirely gone, decay extending above and beyond the ordinary gingival margin when in a normal condition, gum badly inflamed and entirely covered up the root. The first step in the operation was the removal of the excess of gum tissue, and ascertaining that the root still possessed sufficient strength to support a crown, the decay was removed, and the concave depression in the end of the root made smooth with round-ended engine burs, the pulp-canals in the root opened and treated in the usual manner, and the space between the entrance to the canals and the gum margins closed with cotton and sandarac varnish; the patient was then dismissed for the time being.

"At the next sitting the pulp-canals were filled and an impression of the parts taken in modelling compound, from which a plaster cast was made, and from it dies of "Melotte's metal" for the purpose of striking up a thin gold cup to fit the concavity in the end of the root, using enough gold to allow the edges of the cup to extend to the gum margin. When the cup was ready it was adjusted to the root, and with cup in position a second impression with "the bite" was obtained, the cup coming away with the impression, which was transferred to the plaster cast. A Bonwill crown of proper form and shade was then selected, ground, and the upper margins beveled so that they would just enter and be enclosed by the edges of the gold cup, giving it somewhat the appearance of a banded Richmond crown. The next step was to insert a small screw-post of the proper length in each pulp-canal, which being done, a slot was cut in the top of the cup large enough to allow the ends of posts to pass through. The parts were then dried, and the convex surface of the cup painted with a little thick chloro-percha and slipped over the posts to its position on the root, gentle pressure being used to force out the excess of chloro-percha, while a warm blast was thrown on to evaporate the chloroform. The crown was then cemented to its place with oxyphosphate, and the occluding end in the cavity of the crown capped with gold, the whole forming a firm and, to both operator and patient, a very satisfactory piece of work."

Porcelain-Faced Bicuspid Crowns.—Regarding the making of these crowns, Dr. A. W. McCandless says: "The root having been properly prepared, a band is fitted thereto exactly as though an ordinary telescope or shell gold crown were to be made.

The buccal side of this ferrule is cut out with curved shears at about where the porcelain facing is to be placed. Secure a perfect articulation in the usual manner, and then tack the cusp to the ferrule at a point the farthest from the porcelain; now, with the curved shears, cut away the gold of the cusp down to the point of the cusp, approximating the shape of the porcelain face at that end. Grind the facing, and trim the opening in the gold that is to receive it, until the fit is fairly accurate, but not absolutely so, however, as this is entirely unnecessary, and requires too much time.

When the facing has been ground to the proper shape, remembering to always make it a trifle smaller than the space, to allow for the thickness of the gold backing, bevel the edges of the porcelain all the way around, then when the gold backing is thoroughly fitted, which is only accomplished by thorough painstaking, annealing the gold often, and gently tapping to place with a small riveting hammer, place the tooth, backed with pure gold of thirty gauge, in position. Catch the gold backing to the ferrule and cast with sticky wax, slip the porcelain off, invest the gold in long fiber asbestos, moistened with water, leaving only enough gold exposed so that with a small particle of solder, the backing may be united to the ferrule, remove the investment, fill the joints where the solder is to flow, with wax, fill the entire interior of the crown with a paste of plumbago, or stove polish, so that the solder will *not* flow where you would not have it go, then complete the soldering of the joints and flow up sufficient solder to give the proper contour to the finished crown. At this point a lower grade of solder is used for filling the cusps. The porcelain facing is slipped to place, the gold filed or ground to the proper shape and finish, and if the work has been properly done up to this point, a perfect joint between backing and tooth is the result. Remove the facing, then with a thin film of cement between the gold and the porcelain force the facing to place.

After the cement has set bend the pins of the tooth carefully outward from each other, and the facing is held with sufficient strength. In making these crowns 22 carat gold, 28 gauge and 22 carat solder is used, with 14 carat solder in the cusps.

After the crown has been finished and polished send it to a gold plater, who for ten cents will plate it with pure gold, which gives it a very beautiful appearance.

The plating is not designed to cover any pits or other defects caused

by faulty manipulation, as it brings them out and magnifies them, but a crown thus treated will not tarnish in the mouth and the plating is quite durable where no friction comes, and where friction is the tarnish will not come.

There are a good many things to commend this form of crown—natural appearance, strength and utility. No risk is incurred in soldering, the color preserved, permitting more artistic effect in matching the natural teeth and the absence of that blue line so common at the cervical margin of soldered teeth.”—*Dental Review*.

Method of Determining the Comparative Adaptability of Cohesive and Non-Cohesive Gold under Pressure.—In an article on this subject, read before the American Dental Society of Europe and published in the February *Dental Digest*, Dr. W. D. Miller says: “It is an old question, which used to be discussed at dental meetings some fifteen years ago, whether cohesive or non-cohesive gold adapts itself more readily to the walls of the cavity so as to produce a watertight filling. The question was never settled, neither side being able to convince the other. Still it is a question of interest to the dental profession and well worthy of being definitely settled.

If we fold together a sheet of cohesive goldfoil, No. 4, so as to form a square about an inch on a side, and, after having annealed it, press a coin upon it, we obtain a fair impression of the coin and a better one than when we perform the experiment with non-cohesive foil. From this it has been concluded that cohesive gold is more adaptable than non-cohesive. This is, however, a conclusion which is not at all warranted by the conditions of the experiment. Press the coin upon a piece of rubber dam, by means of which we obtain a perfectly watertight joint, and when we remove it we have no impression whatever. In other words the property of retaining an impression is not synonymous with adaptability.

In order to approach the question experimentally I have made use of the following apparatus:

A glass tube about a foot long and $\frac{1}{4}$ inch in diameter is fixed, by means of sealing wax, perfectly upright upon a silver coin about an inch in diameter, which has a hole in the center. The tube carries a platform about 2 inches above the coin, which serves to carry weights.

In performing the experiment we fold together half a sheet (or a whole sheet) of extra cohesive foil to a square about an inch on a side, anneal it and place it upon a perfectly smooth surface. Upon this we carefully place our apparatus. We, then, by means of a funnel, which is drawn out to a fine point, so as to give a very thin and regular stream of water, slowly fill the tube with water and mark the height to which

the water rises in the tube before it begins to escape between the coin and the gold.

Now dry the apparatus and repeat the experiment with non-cohesive foil, not annealing, and note the height as before. Naturally the better the adaptation of the foil to the coin, the higher the water will rise in the tube before it begins to escape under the coin.

Repeat both experiments an indefinite number of times, weighing the apparatus with weights gradually increasing from $\frac{1}{16}$ pound to two or more pounds. The weights may be made of lead and should be ring-shaped, so as to pass over the tube. Fresh gold must, of course, be used for each experiment.

The experiment may be varied by filling the tube to a certain height and noting the time which elapses before the water begins to escape, as well as the amount of water which escapes in a given time."

In the experiments following it was proven that under low-pressure non-cohesive gold is more adaptable and gives a better joint than cohesive. "It will be interesting," he continues, "to determine whether the same holds good for high pressure."

A Method for Adapting Logan Crowns.—In an article in the *Dental Digest* Dr. R. Ottolengui gives his method of adapting Logan crowns. He says:

"Logan crowns, for many reasons, are most valuable, yet they often fail. Two chief causes mainly contribute to such result. First, the approximating surfaces of crown and root are not accurately adapted the one to the other. At some point a space occurs, so large that there must be an excess of cement—which, eventually washing out, leaves a pocket for the retention of debris. Decay creeps in, and when the crown finally comes off the root is found to be too far destroyed for further salvation.

Second. An inflamed condition of the gums follows the placing of the crown. Where this proceeds to extremes, a suppurative stage ensues, which marks a pericementitis at first restricted to the vicinity of what was the neck of the tooth, but rapidly progressing towards the for-
aminal extremity, where it ends in alveolar abscess and loss of the root. The trouble is that the crown was not circumferentially adapted to the root, but by overlapping rested upon the gum tissue, producing irritation, absorption, a space for lodgment of food, and destruction of the soft tissue in consequence.

A plan which obviates these two difficulties should be welcomed by the profession. It is as follows:

The root and crown are prepared as usual with the best skill of the operator. Then take pure gold plate, 34 gauge, and form a disk having a hole in center for the passage of the pin.

This disk is softened by passing through the flame, and placed over the crown, the pin passing through the hole. Next the crown is placed into position and the disk thus forced against the end of the root.

This will *approximately* mark on the disk the circumferential shape of the root end. The disk is now moved from the crown—the excess of metal trimmed away—and it is tried on the root from time to time (not on the crown) until the circumferential shape of the disk and root end are identical. . . .

“Gutta-percha is now placed in the hollow part of the crown around the pins, and the disk is warmed and pressed to place, the gutta-percha holding it there—while with small corundums in the engine the lateral excess of porcelain is ground away until the end of the crown coincides circumferentially with the disk—and consequently with the root end.

This accomplished, the crown is warmed until the gutta-percha is slightly softened, and it is then placed in the root and quickly driven home with a few smart raps with a mallet. The gutta-percha will be resistant enough to compel the soft gold disk to take impress from the root end, thus adapting itself accordingly. At the same time should there be a space anywhere the gutta-percha will be forced through at that point and when removed it will indicate not only that the approximating surfaces are not yet coincident, but it will also point out exactly the connection needed to perfect the fit.

The disk and gutta-percha are removed to allow grinding with a corundum, and this process is renewed until the fit is as accurate on approximating surfaces as it was made circumferentially.

The disk finally takes an accurate impression of the end of the root touching it, and it and the gutta-percha are left in place when the crown is finally set. Thus we have a close joint, with a minimum amount of cement, and also accurate adaptation circumferentially. Set in this on way, healthy roots, Logan crowns are permanent fixtures—or as much so as anything in the mouth can be.”

A New Method for Preparing a Shell Crown.—In a paper read before the Barrettonian Society and published in the *Dental Practitioner and Advertiser*, E. E. Mills describes his method of preparing a shell crown as follows :

“This crown is intended for bicuspid and molars in which one or more of the cusps of the tooth to be crowned are intact. It is especially adapted for forming abutments for bridges, when it is not desired to sacrifice much of the tooth-tissue.

The preparation of the tooth is practically the same as for any other crown, except that the whole of the top is not ground off to make a flat

surface. The sides are ground enough to enable the operator to fit a wide band upon it, and enough of the occluding surface to allow space for a plate of gold of about 24 standard gauge. But to gain this space the cusps of the tooth are not ground off flat, but are reduced just as much in the sulci as upon the summit of the cusps, thus preserving the exact contour of the grinding surface, the tooth being reduced the same amount in length at all points.

To do this, the fissures are first cut out with a bur, after which the remaining coronal surfaces are ground off by the use of any stone that may be adapted to the work. The tooth is thus reduced as much as is required for the method, while the shape of the cusps is retained, and a considerable amount of tooth structure is saved. The patient is thus relieved of pain and annoyance, and this is a point to which the efforts of the profession are now specially directed.

After the tooth is thus prepared, the band is to be fitted. This is left as long as it is desired that the crown shall be when finished, instead of cutting it down to allow space for the swaged cusps. The next step is to contour the band at its articulating surface, that the natural appearance as to shape may be preserved. This is done by grinding or cutting the occluding edges down to the line of the prepared tooth itself, following the outline of the cusps and depressions, but leaving it to project above the tooth the thickness of the 24 gauge plate previously referred, which space is subsequently to be filled with solder of a high grade.

The band being in position, the open occluding edge is stopped with a piece of softened modelling compound, which is pressed down upon the occluding surface of the tooth. After this has hardened, the band, with the modelling compound in position, is removed, and the whole is invested in sand and plaster, allowing the modelling compound to project. As soon as the investment has hardened sufficiently, the modelling compound is removed, leaving exposed a complete model of the coronal surface of the tooth.

A piece of thin platinum is now fitted inside the band, which covers the model of the crown of the tooth. Flux of a creamy consistency is then used, and by means of a blow-pipe fine solder is flowed all over this to the thickness necessary, which will be indicated by the projection of the band above the platinum. For the sake of economy this filling in of the top may be made most entirely of scrap gold, merely using enough solder to unite the pieces into a solid mass. After the crown is thus filled, it may be at once put into cold water and cooled, when it should be again heated to a red heat and dropped into alcohol, which will leave a clean surface that will not be objectionable to the patient when it is tried in the mouth.

It should now be put in position, when by the use of articulating paper and the proper stones mounted for the engine, it may readily be made to articulate perfectly, without cutting down the cusps of the occluding tooth, while it will have the exact length of the natural tooth, thereby avoiding the unsightly appearance of a crown that is either too short or too long.

All that now remains is to remove the crown, polish it up properly, and reset it with cement, or in any other method desired. There will now be a crown with no line of solder around the band. Sometimes this becomes tarnished when a swaged top is soldered to a shortened band, even though the solder may be of high grade. Aside from this advantage, the following points of superiority are claimed for the crown, in those cases to which it is adapted: First—Saving of tooth structure. Second—Saving of pain and annoyance to the patient, and labor for the operator. Third—Economy of time and material. Fourth—More perfect articulation with a better reproduction of the natural tooth."

Interesting Methods.—The following are taken from the clinic report of the union meeting of the First and Second District Dental Societies of New York, as published in the *Dental Cosmos*:


Methods of Attaching and Replacing Porcelain in Crown- and Bridge-work without Cracking or Breaking.—The root is prepared and shaped in true contour with the alveolar process. The band is shaped parallel with the alveolus which brings the cap when in place close down to the root. After attaching the cap piece and pin in the usual way, the porcelain is ground to fit and backed up with stout backing. Do not bend the pins, but hold in place with a little soft wax. The backing is secured to the cap with hard wax. Then by running a thin-bladed knife between the face and the backing, the face will slip out of position and leave the pin-holes open and exposed. Take black lead points, No. 4½, made by Henry Cohen, Philadelphia, cut in half, and insert a piece into each hole. Invest as in ordinary work, and solder. The solder will flow around the carbon or lead cores, which are easily removed with a fissure drill. Make a countersink in the solder with a cone bur at each pin-hole, and set the tooth in position, using a little cement, if desired, to close any possible space. Invest in hard modelling compound, and with punch and hammer rivet the pins into the countersinks. Polish and set the piece.

If a crown is broken while the crown or bridge is being worn, grind off the pins to the backing and drive out the remaining part. Fit in a new face and set with cement. Hold a piece of lead or a lead mallet on the facing, and, with the automatic mallet, drive the pins down into the countersinks. This makes a head on the pins, and crown or bridge is as

good as new. Replacing a facing should not consume more than twenty-five minutes.

Method of Tipping.—Dr. Levi P. Howell performed the following operation of “tipping.” The right central incisor, inferior, was missing. He ground the incisors each side of the missing one on the articulating surfaces, down about the thirty-second of an inch, drilled two pits three-sixteenths of an inch down each side of the pulp, but not coming in contact with it, placed a piece of twenty-four carat gold on the surface of the teeth or tooth, ground and drilled, burnished the gold plate to fit the top of the tooth, then plunged a piece of iridio-platinum wire (which would easily pass through a slot 21-gauge *standard*). On these caps was built up with eighteen-carat gold the space ground away. After building up, he placed them in position on the teeth, backed up a plain plate lower incisor, waxed it in position to the two tips, removed the tree pieces, invested, soldered the dummy to the tips, then cemented the whole piece with oxyphosphate, making a complete bridge without destroying either pulp in the attaching teeth, and at the same time placing the whole strain in a direct line with the root of the tooth.

A Self-Adjusting Crown.—Dr. G. A. Bowers presented a practically self-adjusting gold crown, which he claimed was an improvement on an old idea and a greater improvement in method. It admits of being taken off and on for the purpose of trimming to the festoon of the gum an indefinite number of times. The fit is in no way affected by this. The open band with overlap adjusts itself to the root in the process of alignment. The overlap makes it possible of adjustment to different spaces and varied sizes of roots. The patient can bite into this plastic crown and a perfect occlusion is thereby secured. The absence of stiffness or rigidity makes burnishing to the root for final fitting extremely easy. The crown is so far ready made as to only require soldering the band, and yet is capable of a perfect fit without the use of wire, copper strip-ligature, or other measuring device. This method is equally as good in crowning a third molar as a bicuspid.

In construction, twenty-two carat plate, 29 gauge, and twenty-two carat solder is used. A cameo die-plate is used instead of an intaglio. Selecting an approximate cusp from the die-plate, the thug is driven into it. A square piece of gold is then cut, annealed, and pressed into the cusps with the fingers, then driven down with the thug. It may be necessary to anneal three or four times to secure a perfect cusp. After trimming and facing, a strip of gold the length and width required is cut, shaped thus , which is bent to approximate contour and faced with the file. The cusp is placed on the band, held with tweezers, and caught with solder. The band is then bent to the exact contour of

cuspid, and soldering completed. In using these crowns, select the one desired. Having the root prepared, push the crown on until it touches the gum, then take it off and trim; continue until it is in alignment with the other teeth. Let the patient bite to secure perfect occlusion. Burnish the band, solder the seam, and fill the cuspid with twenty-carat solder. As these caps fit so perfectly, it is advisable to bore a small hole in the cuspid to allow the excess of cement to escape. This can afterward be filled with mat gold.

A Partial Crown with Shoe, Adjusted to the Cuspid for the Support of the Adjoining Lateral Incisor.—The method of Dr. C. G. Pease was as follows:

A gold band was fitted upon the cuspid without grinding it at any point. It was fitted at the cervical margin as in an ordinary crown. The labial and palatal portions were then cut out up to the portion in contact with the tooth on the palatal aspect, and anteriorly as high as necessary to leave a band of desired width at the cervical portion of the tooth, leaving the sides of the band in contact with the sides of the tooth. The edges of the band corresponding with the border of the flat surface of the tooth posteriorly were trimmed parallel with that surface. The band was then removed and soldered at one point to a piece of platinum rolled very thin, and cut to correspond with the flat portion of the tooth. The band being replaced, the platinum was burnished to the tooth to form the shoe in perfect adaptation to tooth.

A plaster impression was then taken of the palatal surface of the tooth with the band adjusted. Before filling the impression, the sides of the band and the platinum should be in close adjustment to impression. The band was then filled, removed from impression, and platinum soldered to the sides of the band, flowing solder all over the platinum. The band was then placed on the tooth and the porcelain lateral incisor, ground up, backed and placed in position in the mouth, being held in place by wax at the palatal portion. A plaster impression was then taken of the labial surface of the tooth and the band, filled, separated, and invested for soldering. In soldering, flow from the backing of the tooth to the palatal surface of the partial cap, and the bridge is completed.

Method of Making Bicupid and Molar Crowns.—Dr. J. B. Littig demonstrated his method by making a cap entirely of platinum, resembling an Evans gold crown when completed. The face being then cut out and a piece of platinum let in—or the face depressed so as to form a cavity corresponding to the buccal aspect of a tooth—porcelain was baked in this depression, using Downie's body. After fusing the body, the platinum was fire-plated with Roman mat gold.

OBITUARY.

J. J. R. PATRICK.

DR. PATRICK, of Bellville, Ill., died April 10th, after a lingering illness. He was born in Liverpool, Eng., in 1828. He came to America in 1842 and in 1848 learned the trade of a goldsmith at St. Louis. Later he studied dentistry with his brother and after attending one course of lectures in the McDowell Medical College, commenced the practice of dentistry at St. Louis. In 1853 he moved to Bellville, Ill., where he practiced up to the time of his death. For many years the doctor interested himself in the study of paleontology, spending much time and money in this pursuit. He had the Indian mounds, which are numerous in St. Clair county, surveyed, and models made to scale of many of them. These are now in the scientific collections of this and many other countries.

The Patrick collection of pre-historic crania, together with much other of interest from these mounds, is now in the collection of the Missouri Historical Society.

Dr. Patrick had an enviable reputation in the profession. He leaves a wife, two brothers and hundreds of friends to mourn the loss.

RESOLUTIONS ON THE DEATH OF J. J. R. PATRICK.

AT the Mississippi Valley Dental Society Drs. Harlan and Betty, Committee on Condolence, reported as follows:

WHEREAS: It has pleased an all-wise Providence to remove from our midst John J. R. Patrick, D.D.S., long a member of this organization, and a conspicuous figure in many dental societies in this country, as well as a prominent citizen of Illinois:

THEREFORE, *Be it Resolved*, That in the death of Dr. Patrick, dental surgery and dental science has lost one of its most ardent devotees and distinguished members; and this Society desires to express its sorrow at the loss of one of its fellows who had so long maintained the dignity of the profession.

A. W. HARLAN, }
E. G. BETTY, } *Committee.*

On motion the report was received and adopted, and ordered spread upon the minutes. As a mark of respect the vote taken was by all members rising in their seats.

RESOLUTIONS ON THE DEATH OF DR. L. GILMAN.

At the 19th annual meeting of the Vermont State Dental Society, held at Brandon, the following resolutions were adopted on the death of Dr. L. Gilman of St. Albans :

WHEREAS—It has pleased our Heavenly Father to remove by death, since our last annual meeting, our esteemed brother and associate in the dental profession Dr. L. Gilman, of St. Albans.

WHEREAS—Not only has this society lost an active and constant member, but the profession at large have met with an irreparable loss ; therefore,

Resolved, That Dr. Gilman being a charter member of this society and having always been active in everything which added to its elevation and success. Therefore, we deem it highly proper at this time to give expression to our high appreciation and friendship, and of our sincere regret that one who was so essential to the interests of the profession should have been summoned to a higher council.

Yet while bowing to the will of our Heavenly Father we cannot refrain from giving expression to our feelings of sorrow that he should be removed from us.

Resolved, That these resolutions be placed on the memorial page of this society, and that the Secretary be instructed to send a copy of the same to the afflicted family, to the *St. Albans Messenger*, and to the dental journals.

E. E. MCGOVERN,

C. S. CAMPBELL.

JAMES LEWIS,

Committee.

 NEW PUBLICATIONS.

THE TREATMENT OF WOUNDS, ULCERS AND ABSCESSSES. By W. Watson Cheyne, M.B., F.R.S., F.R.C.S., Professor of Surgery in King's College, London. In one 12mo. volume of 207 pages. Cloth, \$1.25. Philadelphia, Lea Brothers & Co., 1895.

This little work owes its brevity and its widespread usefulness to the fact that it is devoted wholly to the treatment of affections which, though nominally surgical, are yet so common as to form part of the daily work of any medical practitioner. Antiseptic methods have revolutionized surgical procedures and have added

vastly to their successes. Prof. Cheyne is one of the foremost of London surgeons, and a critical student of antiseptic procedures in their practical bearings. In this volume he has described the methods of treatment which he employs and which he knows "to be efficient and to be the simplest consistent with certainty in results."

THE YEAR-BOOK OF TREATMENT FOR 1895. A Comprehensive and Critical Review for Practitioners of Medicine and Surgery. In one 12mo. volume of 501 pages. Cloth \$1.50. Philadelphia: Lea Brothers & Co., 1895.

To have the real advances in treatment in all departments of medical practice culled by recognized specialists from the immense mass of medical literature, and presented with critical remarks in a classified form for immediate use, is assuredly a help towards success which busy practitioners will not neglect, and which other practitioners will consult for the soundest of business reasons. The reader interested in a special subject can quickly post himself on whatever is new and good in treatment by a perusal of the chapter devoted to it, and the general practitioner can with facility turn to any topic by a glance at the index. The volume is exceedingly cheap in proportion to intrinsic value and serviceableness.

TRANSACTIONS OF THE AMERICAN DENTAL SOCIETY, 1894.—As usual this volume is filled with interesting material. Coming as it does from some of the best men in the profession, it makes a record well worth preserving. The transactions are always well edited and printed.

FREE OF CHARGES:—The therapeutical applications of Peroxide of Hydrogen (medicinal), Glycozone and Hydrozone, by Charles Marchand, Chemist. Ninth Edition.

This book of 200 pages, which contains all information on the subject, with reprints of elaborate articles by leading contributors to Medical Literature, will be mailed to doctors mentioning this publication.

Send full address to Charles Marchand, 28 Prince St., New York.

SOCIETIES.

PROGRAM TRI-STATE DENTAL MEETING.

To be held at Detroit, Mich., June 18, 19, 20, 1895. Railroad rates from all parts of Ohio, Indiana and Michigan, have been secured on the certificate plan. Purchase a full fare ticket to Detroit and get a certificate from the ticket agent to show that you have done so. Bring the certificate to Detroit, have it signed by G. E. Hunt and countersigned by the railroad agent who will be at the meeting, and you can get a return ticket for one-third fare.

The Russell House will be headquarters. Rates \$2.50 to \$3.00 per day. The Hotel Normandie is close by. Rates \$2.00 to \$2.50 per day. The clinics and literary sessions will be held in the Dental Department of the Detroit College of Medicine. Following is a partial list of the papers and clinics, to be presented:

1. Etiology and Treatment of Alveolar Hemorrhage,
Otto Arnold, Columbus, Ohio.
2. The Dentist in his Profession and Among the People,
S. B. Hartman, Ft. Wayne, Ind.
3. Reflex Neuroses of Dental Origin, E. T. Leoffler, Saginaw, Mich.
4. Generation and Degeneration of the Tissues of the Mouth,
W. H. Whitslar, Cleveland, Ohio.
5. Resodontology, or Hulihen's Operation,
S. B. Brown, Ft. Wayne, Ind.
6. The Nervous Control of the Circulatory and Respiratory Systems
as Related to Conditions of Syncope and Cocaine Poisoning,
A. W. Diack, Detroit, Mich.
7. The Development of Facial Expression by Applying Force to
the Teeth,
C. S. Case, Chicago, Ill.
8. The Pathology of Inflammation, G. E. Hunt, Indianapolis, Ind.
9. Business Education for Professional Men,
C. B. Blackmarr, Jackson, Mich.
10. Some Incompatibilities, J. S. Cassidy, Covington, Ky.
11. A Method of Teaching Physiology, M. F. Ault, Kokomo, Ind.
12. Bacteriological Pathology, with lantern illustrations,
W. C. Barrett, Buffalo, N. Y.

CLINICS.

1. The Knapp System of Crown and Bridge-work and Use of the
Knapp Blow-Pipe, Dr. Myers, Cleveland, O.

2. The Hollingsworth System of Crown and Bridge-work,
J. G. Hollingsworth, Kansas City, Mo.
3. Baking Porcelain in an Electric Oven, L. E. Custer, Dayton, O.
4. Baking Porcelain in the Downie Furnace.
5. Baking Porcelain in the Land Furnace.
6. Local Anesthesia by Injection, N. W. Hiatt, Marion, Ind.
7. Local Anesthesia by Injection, N. S. Hoff, Ann Arbor, Mich.
8. Fusing Platinum using the Electric Furnace as a Rheostat,
L. E. Custer, Dayton, O.
9. Filling Root Canals with Lead Points,
W. S. Rawls, Indianapolis, Ind.
10. Soft Foil Filling, S. T. Kirk, Kokomo, Ind.
11. Staining Porcelain Teeth, G. H. Wilson, Cleveland, O.

PROGRAM :

Tuesday, June 18. Morning—Papers.

Afternoon—Clinics.

Wednesday, June 19. Morning—Papers.

Afternoon—Clinics.

Evening—Dr. Barrett's Lantern Lectures.

Thursday, June 20. Morning—Papers.

Afternoon and evening—Excursion to St. Clair Flats and Supper.

Everybody come.

G. E. HUNT, *Secretary*,

NOTICE TO DENTAL SOCIETIES.

THE American Dental Association holds its next meeting at Asbury Park, N. J., Tuesday, August 6th, 1895. I am requested by the President, Dr. J. Y. Crawford, to give notice that it is the privilege and duty of each State and Local Society to appoint and send delegates to the American Association.

Each State and Local Society which has adopted substantially the same Code of Ethics as that governing the conduct of members of the American Dental Association is entitled to one representative for every five members and fractional part thereof.

Blank certificates for delegates may be had on application to the Corresponding Secretary.

Many questions of interest will come up for discussion at this meeting, and every Dental Society in the United States should be fully represented in this, our National Convention.

EMMA EAMES CHASE,

Corresponding Secretary American Dental Association.

MISSOURI STATE DENTAL ASSOCIATION.

THE thirty-first annual meeting of the Missouri State Dental Association will be held at Pertle Springs, July 9 to 12, 1895 inclusive. All dentists in Missouri are especially invited to attend and a cordial invitation is extended to those of other states. It is expected that this will be one of the most interesting meetings in the history of the Association.

W. M. CARTER, *Corresponding Sec'y*,
Sedalia, Mo.

THE COLORADO STATE BOARD OF DENTAL EXAMINERS will meet in Denver, June 18 to 20.

D. MURRAY, *Sec'y*.

OUR AFTERMATH.

DR. W. D. MILLER ILL.—In a personal letter Dr. Miller writes that he has been suffering for nearly three months from the effects of influenza, which has left him in such a condition that he is unable to do anything. He thinks he will not be able to pursue his bacteriological work at all this summer. His friends in this country will be sorry to learn of this, but we all wish him a speedy recovery.

COULDN'T STAND THE PRESSURE.—An explosion, April 29th, in the dental rooms of George H. Coleman, on Washington avenue, Lansing, Mich., shook the entire building and startled all in the immediate vicinity. Upon investigation it was found that Dr. Coleman, while busy in his laboratory, was suddenly thrown in a heap and covered with debris by the terrific exploding of a vulcanizer. Several window lights were broken and Mr. Coleman's left hand was badly burned and cut.—*Daily paper*.

VINDICATED —When Brother Patterson, of *The Western Dental Journal*, gets the contents of his bump of combativeness stirred up he generally makes the fur fly. Some time ago Dr. Atkinson, of the Kansas City College of Dental Surgeons (not the Kansas City Dental College, of which J. D. Patterson is sec'y), sued the editor and publishers of the *Western Dental Journal* for \$10,000, for exposing the workings of the Atkinson College. The termination of the suit was a complete vindication for the *Western Dental Journal*, and the good effects resulting from this vindication will be felt by the profession in general.

SHOULD BE PREVENTED BY LAW.—Fort Scott, Kan., May 1.—At Hyattsville, a small village near here, half a dozen people, including the Methodist minister, have been poisoned, some of them perhaps fatally, by medicine administered by a traveling woman dentist, who has skipped town since the condition of her patients became known. The names of the victims, as far as known, are Rev. Taylor Paxton, pastor of the Methodist church; Miss Myrtle Wallace, Nora Burtwell, Mrs. William Clark, and Lizzie Liddell.

The dentist traveled under the name of Dr. Alberta Oberlin, and claimed to come from St. Louis.

The town is torn up in excitement over the affair, and telegrams have been sent in every direction in an endeavor to head off the woman, who is described as a "large, remarkably handsome woman, of stylish and prepossessing appearance."

Dr. Oberlin came to town a few days ago, and stopped at the main hotel, advertising herself as a "painless tooth extractor, of St. Louis." Many of the most prominent people of the town answered her advertisement. She applied to the gums of a number of her patients a liquid. Soon after the operation the patients were invariably taken ill, their faces and hands became discolored, their tongues swollen, and their stomachs affected. When the condition of her patients became serious, the woman quietly disappeared. Ever since then the village doctors have been kept busy trying to alleviate the pain of the unfortunates, but to no avail, and to-day the prosecuting attorney was appealed to, the doctors declaring the villagers had been poisoned. A warrant was sworn out for the dentist's arrest, but she could not be found. Miss Liddell is dying to-night, and it is feared some of the others may succumb before morning.—*Cleveland Leader Special.*

DEATH OF MRS. GRANT MITCHELL.—The many friends of Dr. Grant Mitchell, Canton, O., will be grieved to learn of the sad untimely death of his estimable wife. We clip the following notice from a Canton paper: "The angel of death, yesterday, April 28, visited a home that God had but recently made glad with a little baby, and took away the mother. All that was once mortal of Mrs. Dr. Grant Mitchell is now pulseless clay. A happy and loving mother has been called away from that little one and a kind and indulgent husband, who but a short time ago was happy in the thought of both, is bowed in grief. Many a tear was shed in Canton, yesterday, when it was known that the gentle spirit of Mrs. Mitchell had returned to the God who gave it.

Her death was very sad and untimely. She was just entering a new life and with the fondest hopes of the future, the silver chord broke and on angels wings she was borne to that home not made by hands, immortal in the Heavens.

Mrs. Mitchell was a good and noble woman. She was of kind and generous disposition and had a large circle of friends who loved her for her many sterling qualities. Her character, pure and true, was admired by everyone who felt her presence. Such a death is almost past understanding; she had everything to make life worth living, a happy home, a kind and affectionate husband, a clinging babe, yet that Ruler of the universe called her up higher.

Mrs. Carrie Lahm Mitchell died at her residence in the Hannah block. The cause of death was fever, incident to the birth of a two-weeks'-old boy baby, which still survives her. The deceased was a daughter of the late Judge John Lahm, and was married to Dr. Grant Mitchell, December 3rd, 1890. She was in her 28th year."

The OHIO JOURNAL and a host of the doctor's friends extend heartfelt sympathy to Dr. Mitchell in his bereavement.

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CONTRIBUTIONS.

SANITARY REMOVABLE PORCELAIN BRIDGE-WORK.

BY ADAM FLICKINGER, D.D.S., ST. LOUIS, MO.

IN this age of progress, when science, art, and mechanism are trying to outdo each other, and are necessitating a higher general education and application of more skill in the various callings, dentistry has not been idle, as is shown by the many furnaces for porcelain bridge and crown-work, which have been put on the market in the past few years; and truly this is a step in the right direction.

Was there any work in prosthetic dentistry in the past—even up to the present time—that could be truly classed artistic, excepting the old continuous gum work? Does it not require a higher class of skill in its construction? True, this work has some objectionable features, but they are few, (and what class of dental work has none?) nevertheless, it is worthy of the title of “artistic work” when properly constructed.

With the many quick baking bodies and innumerable inexpensive furnaces, porcelain work undoubtedly has a great future before it, especially if utilized in the construction of so called bridge-work.

Can any one imagine a more beautiful sight, than four incisor teeth mounted in such a manner as not to disclose any metal

The editor and publishers are not responsible for the views of authors of papers published in the OHIO DENTAL JOURNAL, nor for any claims that may be made by them.

whatever, even upon close examination? Bridge-work constructed on the Parmley Brown method is *par excellence*; it consists of a heavy saddle iridio platinum, a heavy bar strengthening the plate, to which the teeth are soldered with pure gold, and finally the whole body or palatine surface baked over the metal, covering every vantage of the same, and the whole retained in the natural teeth or roots, if available.

This makes one of the prettiest pieces of bridge-work ever constructed, displaying no walking jewelry shop, as most bridges, made at the present time, do. There is, however, one objection to Dr. B's method, one common to all other methods of bridge-work, besides the display of metal, and that is—immovability—in case of an accident or of shrinkage of the gum.

To overcome these two objections, I have, for a number of years, constructed all of my bridge-work in such a manner, that it can be removed and replaced easily and with little expense to the patient; this method I have recently applied to porcelain bridge-work, and when constructed on this principle, it can be removed in a few minutes, without mutilating the bridge, posts or any other anchorage; and in case of a slight receding of the gum, my bridge can, with the greatest ease, be forced up to hug the gum as closely as the case may require.

Every dentist constructing bridge-work, especially porcelain faced bridge-work, has found to his own and his patient's dismay how annoying and exasperating it is, to have work returned after a short time with a tooth or a facing broken off, or a slight shrinkage of the gum, allowing food to lodge and gather under the bridge. He also knows how difficult it is to remove and replace the work to the satisfaction of both patient and operator, at a moderate expense—which, by the way, is most emphatically expected by the patient, since we were handsomely remunerated in the first place(?).

Here is where my improvement comes in, an inestimable boon to both parties concerned.

Having put my method to the most thorough test for the past two years, and having applied it successfully in the construction of porcelain bridge-work for the past seven months, I now offer it to the profession with full confidence in its utility and practicability, combining the *beauty* of Dr. B.'s method, with simplicity of adjustment, removal and replacement.

The whole appliances necessary in the construction of my removable bridge work consist of six parts composed of plat. irid :



Fig. I. Post with screw thread.



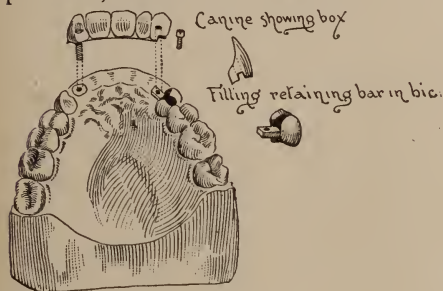
Fig. II. Box to be soldered on band to retain screw nut.

Fig. III. Screw.

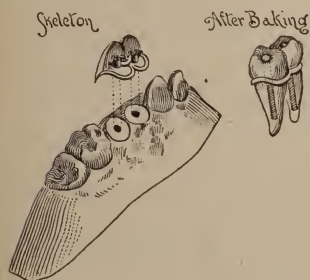
Fig. IV. Enlarged box to slide over bar

V retained by screw VI.

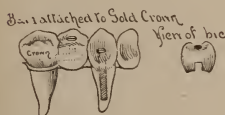
The following four cases now in the mouths of respective patients, illustrate the work :



Case No. 1. (See Fig. II.) shows bridge with five anterior teeth, anchored to the right lateral root, and left first bicuspid, the bar being filled in and retained by a gold filling.



Case II. Shows first and second bicuspid anchored to roots on the crown principle, with bands, etc. 1st bicuspid post enters close to the bifurcation of roots, with two projections for each root.



Case III. Shows three porcelain and one gold crown, viz: Lateral canine, first bicuspid and gold crown on second bicuspid. The bar V being soldered to the latter—the canine roots with post I. box II. and screw III., also band as in crown work—are the anchorages.



Case IV. Shows four incisors anchored to lateral roots, with post, box and screw—I., II., III. and bands, fitted accurately.

ENGLISH TUBE CROWNS FOR BRIDGE-WORK.*

BY J. R. CALLAHAN, D.D.S., CINCINNATI, O.

WE will admit, that modern bridge-work when properly constructed, is a blessing to suffering humanity; but great as the blessing may be, we have to acknowledge that there are many weak points that even the expert is unable to overcome.

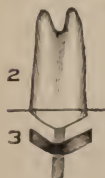
The man that will show us how to make the attachments to roots, that will not irritate the gums, that will not afford lodgment for food, that will not make a disgusting display of gold, that will not break or twist out of shape, that can be repaired without destroying the whole piece and can be adjusted without destroying sound teeth; that man will confer a great blessing upon our profession as well as upon thousands of people, who carry about in their mouths, those unsightly, broken and stinking abortions that are altogether too common in our midst.

It is our desire to call your attention to at least a partial correction of some of the defects in bridge-work as constructed in this country. The points in favor of the use of the English tube crowns in the construction of bridge-work, that we wish to demonstrate to-day, are the concealment of metal, the introduction of crowns that are easiest to mount and least liable to fracture, that do not change their color during the course of construction of the bridge and that are easiest to replace in case of accident.

We will give a few details for the construction of a simple piece of bridge-work extending from first superior molar to first superior bicuspid. The abutment teeth are ground to the shapes



Fig. 1.



shown in Fig. 1 and 2; Fig. 2 being the approximal surface; gold caps are then made to fit these stumps. After caps are in place upon the roots, cut a hole through the cap just over the root canal for the pin to pass through, being careful to have opening of such dimensions that the pin wire made for these teeth will fit in the cap snugly. Having selected a suitable crown, fit it roughly to the cap; place the pin in the root and try on the crown, if it be much out of line with the other teeth the fault must be put right by bending the pin or reaming the canal

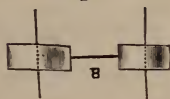
* Read before the Mississippi Valley Dental Society, April, 1895.

in the direction necessary; try on the teeth once more, when the proper position of the pin has been ascertained, remove cap and pin from the mouth and solder the pin in its place.

Fig. 3 showing pin and cap after being soldered. (Be careful to use smallest amount of solder and to get perfect attachments.) The caps should now be put in position and the crowns placed loosely on the pins; the crown to be suspended between molar and first bicuspid is now fitted to its place; the neck or that portion of crown coming in contact with gum, should be ground to the shape shown in Fig. 4; a very thin platinum plate should now be soldered to a piece of pin wire of proper length. See Fig. 5; pass the wire pin through the tube in the crown and burnish the platinum plate to the V shaped portion of crown just referred to, see Fig. 6; now dry the crowns and caps in the mouth, place a little sticky wax on the second bicuspid crown and platinum plate and force all the pieces to place in the mouth. With a camel's hair brush place a very thin film of oil over the porcelain crowns, then remove the whole bridge from the mouth by means of plaster in the impression tray, trim the plaster from about the metal parts, then cover the pins and caps with impression compound—allow the compound time to become thoroughly cool, then cut away the plaster and remove the crowns; the oil that was placed on the crowns will make this easy to do; this will leave the pins sticking from the modeling compound as in Fig. 7; now place a



Fig. 7.



mixture of plaster and marble dust over these pins and after it is dry, remove the modeling compound by means of dry heat; this will put the metal parts in position to be soldered together and the porcelain crowns are out of the way, or in other words the piece will be soldered together without subjecting the porcelain to

the heat that so often cracks and otherwise injures them. Place a piece of platina-iridium wire extending from molar to first bicuspid, in the depressed platinum that was on the second bicuspid crown, flow enough solder over this to make a strong and smooth union; cool and remove and finish; the piece will then be as seen in Fig. 8. Place the metal on the roots in the mouth, adjust the crowns on the pins and see that everything fits to its place; then finish grinding the occluding surfaces; then remove

the whole piece from the mouth, roughen the pins slightly with a fine file, then boil all the parts in acid to remove every trace of oil or grease, dry with alcohol, then we are ready to attach the crowns to the bridge; have a small vessel filled with melted sulphur, with pliers grasp the bridge by the metal pins, the crowns being in position, warm the bridge piece slightly in the flame of Bunsen burner, then with a warm wire carry the melted sulphur to the pin in the grinding surface of crown; the sulphur will run into every crack and crevice in the neighborhood, and when cool the bridge will be ready to be cemented to the roots, and we will have a bridge piece that will show but a small line of gold at the gum border; that has been easy to construct.

The tube crowns are stronger than other kinds of porcelain teeth, for the reason that they are supported over their whole lower surface and the greatest strain in occlusion falls mostly in a vertical direction upon the crown and parallel to the line of the central pin; whereas in a flat tooth,—the attachment being on one side only—the impact of the bite is more evenly distributed, and not least of all they have not been exposed to the heat of soldering, which so often cracks and weakens the teeth in all kinds of metal plate work. The crowns under this method cannot change in color. 1st, on account of their having been kept from the heat and 2nd, because there is no metal backing to contend with; and if a crown should be broken, a new one can be put on in a few moments, without removing the bridge from the mouth. I have yet to see the first one break. These crowns can be gotten either through your regular dealer or from C. Ash & Sons, No. 30 East Fourteenth st., New York City.

To all who are not familiar with this kind of work, and desire to give it a trial, I would advise them to read the paper of Dr. John Girdwood, in the printed proceedings of the World's Columbian Dental Congress.

DISCUSSION.

DR. AMES, Chicago: I suppose that Dr. Callahan asked me to discuss this subject because at different times we have together discussed to a considerable extent this particular class of work and as to the desirability of concealing gold to as great an extent as possible. I think that one of the most desirable objects to be attained in the construction of crown and bridge-work is more

scientifically artistic results than those we so often see. I don't know of any better way to accomplish this than by the use of these English tube teeth, and in the manner described by Dr. Callahan; unless it be by the use of another form of tooth made by the same people; that is, the diatoric tooth which has an opening partly through the crown, instead of all the way. In my use of these, as well as of the diatoric teeth, I sometimes have to proceed rather differently than Dr. Callahan describes here, in order to get the proper alignment of crown on the root. The Doctor says he fits the pin to the root, and if, by placing the crown upon the pin, it does not come in a proper line he reams the root and bends the pin. I am not always able to accomplish it that way. In a majority of cases I make the pin in two parts. To be explicit I would fit the band and cap to the root, perforate the cap, place the pin, which is to be contained within the root and solder it, and cut it off flush with the surface; then I would take an impression of that, as in an ordinary case of crown work—or without an impression work to the mouth direct—and grind my tooth to the position, giving it proper alignment, and then burnish and fit to the crown end of the porcelain tooth a cap, turning it slightly over the edges and perforating that at the point of the hole in the tooth, putting the pin in there and soldering it, and then putting the two in their proper relative position,—and run solder between the two, in that way getting a proper alignment where I could not do it nicely otherwise. It seems to me by using the separate piece of metal, one cap for the root and one for the tooth and burnishing the metal over the edge of the porcelain slightly, having the porcelain tooth in a sort of a bed, gives it a more substantial attachment, I think, than if it is simply set together on a plane surface—it is a sort of receptacle, you may say—and I think it will stand a greater amount of strain. The diatoric teeth, I like a little better than these for bicuspid and molars. Dr. Callahan suggests that I draw a diatoric tooth on the black-board. I think you are all familiar with it. I am not a draughtsman. (A voice: You are a drawer.) Sometimes if I am lucky!

(DR. AMES then drew upon the black-board an illustration, and made remarks accompanying same which it was impossible for the stenographer to follow and re-present in an intelligible manner.) He concluded by saying, I think the first work I did

of this kind was with the English tube teeth, because I happened to have a few of those before Mr. Sykes established the branch of Ash & Sons in this country ; but when he came here I became familiar with these diatoric teeth, and I began their use, because I think you can get better patterns, better selections of these, while they do not carry much of a selection of the tube teeth. It must be five or six years or more ; and I find that while at first glance it often seems that the attachment of the porcelain to this cap would be weak and not be satisfactory, yet from actual experience I find that it is strong. (A voice: the porcelain will break ; can you replace it easily?) I never had one broken. (A voice: What would you do if you did?) I think that you will find that they will hold. I have never had one come off. I have never had the porcelain break or come off, from its attachment ; but I have had the attachment to the root weaken. I have in my pocket (I was expecting to have something to say about this) a tooth that is made up in this way. Here is a molar of that kind, which was a dummy in a bridge piece that I changed, for reasons not necessary to mention, and it will show what can be done with these, and show what I would consider to be necessary as to strength of gold. This was, of course, the dummy between two crowns, and will show about the way this can be done. (Passing the tooth to the audience.) That is attached upon the gold with silver. I find that these teeth, either the tube teeth, or the diatoric, are extremely satisfactory for these dummies. Say you have two bicuspid, you can arrange them in position and flush up the backing here to a sufficient extent to give strength for the span. (The Doctor then explained certain peculiarities in the sample exhibited, and continued :) The advantage in the use of this English porcelain that makes it very desirable to me, is the peculiar texture and homogeneity of the texture and material, enabling you to grind it down and polish it ; and the advantage of doing your work in this way is, that this peculiar porcelain is liable to change color in firing, and in doing the work in this way there is absolutely no danger of getting the color affected. While speaking of this I want to mention a matter possibly a little out of the line of this discussion ; I want to speak of the possibility of using these same teeth for cuspids and incisors, in such a way as to avoid having the porcelain in position while doing the soldering, thus avoiding

the danger of change of color. This is a method that has become popular among men who endeavor to do this kind of work nicely and in an artistic manner; in backing up incisors or cuspids, and then removing the porcelain from the backings, insert through the holes in the backings little graphite pencil points, waxing these in position as the pins would be if the porcelain teeth were there, flowing the solder around these points, drilling out the graphite, the hole being retained by these graphite pencil points, cementing on the and riveting down the pins. I have used that method; and I want to give the credit for my knowledge of that to Dr. Buttner, of Baltimore, Md., who gave me my knowledge of it, I think, in 1889. I have practiced it very satisfactorily since, and inasmuch as that has been written of and shown to a considerable extent recently, the credit of it should be properly placed; and so far as I know, Dr. Buttner was the originator of that, as I obtained the idea of him at least six years ago.

DR. CUSTER: I don't know that I can add very much to what has been said. I can only agree with the author of the paper, because he has given the ideas and principles of bridge-work, when correctly constructed, having reference to the requirements of strength and hygiene and beauty, not omitting the element of repairability. The point of strength, I think, has not been touched upon however. Where a piece is suspended between say, the first bicuspid further back to the second molar, you would have, then, a bicuspid and molar. There is the principle of suspension. As any of you know, metal will stand more strain in a pulling direction than in a bending. We gain more strength at the least expense of metal by this treatment, the tooth being set upon a pin, and the pressure being brought to bear so that the effect upon the gold is simply a pulling strain from one abutment to the other. Another point of strength can be mentioned, and that is, let the teeth be put there on the principle of locking; have a groove ground in the side of one porcelain tooth, and the one that fits into that have a corresponding projection to occupy that groove in its neighbor; let that principle be carried clear along through the bridge; then if the pin were to be broken in any one tooth I apprehend that the tooth would be retained by this locking of one tooth into the other. A point in regard to hygiene is, that the whole space is filled up, the inter-dental space.

That is a necessary thing to observe where two teeth are in touch with one another, and the proper thing, of course, always to observe in filling. Here we have, let us say, three or four teeth, and the interdental space partially filled; why not fill the whole space? Let it be filled solidly. Have either platinum or pure gold next to the mucous membrane, and then block in solidly with porcelain teeth, at the outer surface imitating the surface of those teeth.

The mouth has always seemed to be a self-cleansing thing; yet it is anything but that in many cases coming under my observation. If we are going to fill in there, why not fill it all in with a material that will not deteriorate, and which will not invite microorganisms? and then I think we have done the best thing possible. Another thing, the base being of pure gold or or platinum would not in contact with the mucous membrane produce irritation. During mastication, the food would not be forced in; normal action will keep that self-cleaning. If you have not accurately fitted that case, so that it does not quite come in contact with the mucous membrane, the mucous membrane will fill that in after a time, next to the bridge. I think that is the most beautiful piece of work that can be constructed. There need not be but a mere line of gold on the outside. The point has been touched upon that these teeth may be ground, without marring their appearance, afterwards being polished. The point of repairability is also a strong argument in their favor. It is such a strong one that it is of the highest value, and it is the first recommendation that directed my attention to the use of the teeth; but I have never had to repair them. If necessary it is evident it can be very easily done, by the mounting of new teeth upon the old pins.

DR. EMMINGER, of Columbus: I know so little about these English tube teeth it is hardly worth while for me to attempt to say anything. Some time ago Dr. Callahan wrote me and wanted me to discuss his paper, and said he would forward me a copy of it. That is the last I have heard of it. I came to the conclusion that he was simply making another effort to maintain his reputation, that he has so long enjoyed in this community, among dentists; but the manner in which he has presented this case, I think, displays some very good features. The possibility of constructing a piece of work which would have very little metal exposed, and

also be easily repaired, when it becomes necessary, seems likely ; but I have found in a number of cases of bridge-work that it was not this part that needed repairing ; you need new piers for your bridge ; he has not set forth any plans by which he can obtain them. The English tube teeth, I think, have features of strength which you cannot get with teeth with pins that are burned into the teeth, the latter being liable to fracture, probably from the effects of the fire, which is very annoying to all who have had to do with bridge-work. But these English tube teeth are, I think, much stronger and the case is much easier repaired, and they give much less annoyance to the operator when repairs are necessary. I never have constructed any work in this manner ; and therefore know very little about it, and have not much to say on the subject.

DR. HARLAN : I would like to ask Dr. Callahan, the author of the paper, one question. He says that in case of fracture of one of these teeth it is very easy to repair it. Now, if he uses sulphur, the melting point of which is 268° , I don't think it is very easy to put one of these English tube teeth on the bridge in the mouth. You would have to melt the sulphur, or use oxy-sulphate of zinc, or some analagous substance ; isn't that so ?

DR. CALLAHAN : Yes, sir. In case you have to renew the crown you would have to set it on with cement. I would not attempt to put sulphur on, although I have seen some mouths you could do it in, and it would not hurt them either.

DR. HARLAN ; I only asked that question for fear somebody would get the idea that it would be easy to repair one of those bridges, and use sulphur, because they would have to apply more heat than could be withstood by almost any patient.

One thing that strikes me as something that would be a great improvement in the making of bridges of this kind, is the manufacture of a half-round rim of gold in which to set the end of the ground tube tooth, so as to produce greater solidity, and which could be chamfered off to a minimum in appearance at the buccal aspect ; that would add very much to the strength. Dr. J. H. Spaulding, of Paris, at the last meeting of the American Dental Association of Europe, read a paper on the use of English tube teeth in bridge work, which was published in their transactions a short time ago and in the *Dental Digest* and other publications, that has a pretty good set of directions for making these

bridges, which, added to Dr. Callahan's paper, will make a very complete treatise on that subject up to the present time. The remarks of Dr. Custer about a rest of pure gold or platinum under a bridge under the gum has the same objection that almost all appliances of that kind have, that is to say, they form a nest for micro-organisms; that produces redness, which is similar in kind to the redness that we find underneath rubber plates, wrongly attributed to the coloring matter of the plate.

DR. GILLETTE, of Cincinnati: Dr. Ames gave his preference to diatoric over English tube teeth. The diatoric has a transverse opening, and I would ask him what disposition he makes of that? Does he leave it open, or fill it, or use it in the construction of the crown, making it stronger? And if he fills it, with what material; otherwise it would be uncleanly, it seems to me. *

DR. AMES: The transverse openings connect with the central chamber there, and in cementing as I ordinarily do, that fills the lateral openings. I find that proper cementing saves plugging with gold. I had taken the precaution, in some cases, of plugging those little lateral openings with gold foil; but in these cases in which I did not, I find that the cement remained flush for several years, perhaps.

DR. TAFT: Are there any further remarks?

DR. AMES: If I will be allowed I will say a little more. I omitted to say in regard to what I think we are coming to in this country in this class of work. I think the time is not far remote when we shall have no use for English tube teeth, or diatoric teeth, used in this way. We will make solid bridges of porcelain right through, using, of course, some platinum to make our connection, attachment to the roots, and to give strength of span; but we will have very much more platinum or very much more porcelain embodied in the bridges of the next few years than we have in this.

PRESIDENT TAFT: I would ask if Dr. Ames has any experience, or is it just imaginary?

DR. AMES: I may say that I am adopting it to a greater extent right along, making molar crowns of porcelain, bicuspid crowns of porcelain almost entire, fitting a platinum band cap and dowel to that of the root; then taking what is ordinarily called a saddle-back tooth, which has pins. A saddle-back tooth is similar to a diatoric tooth, with the exception of having pretty

much this shape (Illustrating on blackboard). The saddle-back tooth, instead of having a chamfer, the shape of the diatoric, is more of a saddle-back, the pins coming out at about that angle. (Illustrating). Now, a bicuspid or molar can be adjusted in its proper position upon a platinum foundation, the band cap and dowel having been fitted to the root, and the pins bent down into contact with the platinum cap and soldered, then these places filled in with porcelain and baked—the only facilities I have of doing it at present being a Downey furnace, using Downey materials—this pin being usually allowed to approach as much as can be here; then bending the two pins around this, bending this pin down against the cap, as the case may be, filling in with porcelain and fusing it. I have confidence in that being thoroughly substantial and most artistic of anything possible to make. These saddle-back teeth, more especially for the molars, are to be obtained of better shape than either tube teeth or diatoric; when it comes to the molars you get the buccal surface and the masticating surface of an artistic shape, and all you need to do is to fill in this posterior surface, the getting of contour there being a very simple matter, and I must say I am very much in favor of it.

DR. WRIGHT: I want to call the attention of the Association to a remark of Dr. Harlan's and ask for some explanation in regard to it. Criticising Dr. Custer's remarks, he said there was no particular objection in those plates resting on the gum, to the saliva or food getting in there, but it was micro-organisms. I should like to know what hurt a poor little micro-organism would do under a plate if there was no saliva or any meat and bread, or such things, there?

DR. HARLAN: * Dr. Wright misunderstood me. The object of my remark was to cover the point that peripheral irritation of mucous membrane is the result of micro-organisms' presence. Of course they do find food for their sustenance in the saliva and other substances in the mouth; but the red spot that is usually there is caused by the excretion of the micro-organism, just as the red spot found under rubber and other plates are caused by the excretions of some organism, instead of being occasioned by the coloring matter or the presence of metal or rubber.

DR. WRIGHT: Then it is some specially active micro-organism that Dr. Harlan has a spite against?

DR. HARLAN: That is right.

DR. FLETCHER: I can report some failures. I have a liking to report failures. I have tried making porcelain bridges in the Downey furnace with a platinum foundation. Last week I had a patient come in for whom I put on two bicuspid, using the canine for one abutment, and the first molar for another. I had previously put on some bridge-work on the plan of using a crown covered with gold, fastening to the base, etc.—securely done. That broke down. I bethought myself of this plan, which I adopted. Sent the patient away, telling him I thought now that was something he could not break; I don't think you can chew that to pieces. I did not see him until last week he came in with that bridge broken all to pieces. The platinum bridge itself had been very strong, having been soldered, and made very heavy and using all the porcelain that there was room to use, and the best material, building it out until I thought it was strong enough so that no teeth could break it. But that has been my experience. I have now another one that came back fractured. I saw it more than a month ago—it is made after the same plan, and that I think is going to do the same way. What the mistake is I do not know. But I thought it was the acme of strength so far as bridge-work goes. It has proved to be as much a failure as I ever made, and I make a good many. If Dr. Ames or any other gentleman can enlighten us on that class of work I should be glad to hear it. It has been my plan for years to use very little gold on the teeth. A suggestion was made to me by Dr. Sherman. He takes a rubber tooth, gets rid of the heads of the pins by pinching with a pliers, and covers the teeth completely in the back with gold 22 carats, trimming it around the edge until it perfectly fits the back of it, and forms a shoe at the top, which Dr. Ames spoke of a few moments ago. That is the first step, after you have selected the proper size. My plan is to run in 22 carat solder; then I fit the bridge, filling in with any lower carat solder you may see fit to use, also using platinum and iridium bars to strengthen it. In this way it don't show any gold at all, excepting at the gum margin. It forms a perfect shoe for the porcelain, the work being over the gold, so that it is perfectly protected in that way. If it breaks you cannot take it off and put it on new, as Dr. Callahan speaks of with the English tube crowns. At the same time I have very lately seen a case of

bridge-work broken in a way that no one could imagine. The English tube crowns do very well theoretically if it pans out practically; you could put on a crown accurately, but my experience is that these things break where you least expect it. I believe that the porcelain plan spoken of by Dr. Ames, if it be practicable to put the body together in such a way that the process is available in an ordinary office, and you can get it sufficiently strong, it would be the acme of cleanliness; but the only thing it lacks is the strength, and that is one point I see against Dr. Ames' porcelain work.

DR. AMES: I don't think I claimed special strength, but artistic results, mostly.

DR. CALLAHAN: There is one point not touched upon, and that is the grinding of the teeth. If these English teeth are not exactly the shape you want you can grind them to any shape, then polish them, and have a perfect enamel. In regard to the sort of a bridge Dr. Custer spoke of, I don't think that was understood thoroughly. If you take a bridge in this shape and if the pressure is brought from below, the teeth being in position here, and folding this up something like that (Illustrating), if the pressure was below you can break it very easily, but with the pressure from above down to the center here you could not break it at all, so far as the breaking of the metal is concerned. But if you break the porcelain off, as I say, it can be easily replaced, and there is no danger of breaking the pin on account of the V shape. As to porcelain work being cleanly, those of you who have taken old, continuous gum-plates and put them in the furnace and seen them smoke and get the smell know that they are not very cleanly.

FIRST SUPERIOR BICUSPID.*

BY DR. HENRY BARNES, CLEVELAND, O.

ALL will certainly assent to the proposition that there is a right way to prepare a cavity and fill the same, also a wrong way, modified only by conditions and environments. If there is a right way it must be susceptible of demonstration, and if, in the attempt to prove our position we shall proclaim a fallacy, it is not only the right, but it becomes the *duty* of those discussing the same,

*Read before the Cleveland Dental Society, April, 1895.

to so proclaim it, giving of course, the reason therefor "To be set aright." This we take it, is the aim and object of our frequent meeting together for the discussion of various subjects.

During an observation extending over a number of years, many failures of good manipulators of gold and other filling materials have been noted; not failure of manipulation of material, but failure resulting from incorrect operation, as to prepara-

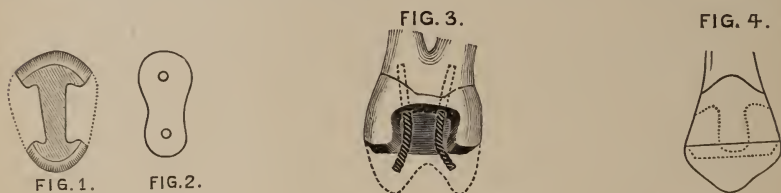


Fig. 1. Transverse section of the tooth, at the contact point, cavity prepared.

Fig. 2. Transverse section of the root just below the floor of the pulp chamber.

Fig. 3. Bucco lingual aspect of the the tooth cavity prepared, pins in position and operation finished.

Fig. 4. Mesio distal aspect of cavity prepared and operation finished.

tion of cavity, etc. We have also noted the fact that a class of operations, based on what seemed to be correct principles, have stood the test of time, hence we conclude that the principles observed in the first case, must be wrong, and those of the latter must be right; so concluding, we shall try to demonstrate, by aid of drawings, made by our worthy co-laborer, Dr. J. F. Stephan, the way which we believe to be correct:

Before entering upon this discussion proper, let us consider this tooth, from the standpoint of dimensions as given by Dr. Black:

1-100 of an inch.		Length Root.	Length Crown,	M D.D. Crown,	M.D.D. Neck.	B.L.D. Crown.
	Average	.48	.32	.28	.19	.35
First,	Greatest	.55	.35	.31	.23	.39
Bicuspid,	Least	.39	.27	.27	.15	.31

By a comparison of these figures, it will be seen that the diameter of the neck M. D. is about two-thirds the M. D. diame-

ter of the crown, and about one half that of its B. L. diameter. Now it is evident that this proportionately large crown is supported on a proportionately slender root, and when we further consider the root is frequently bifurcated to almost the neck, the weakness thereof is more apparent.

OCCLUSAL CAVITIES.

We find on the occlusal surface, a mesial and distal pit, a mesial, distal and central groove, also mesial, distal and triangular grooves. How often are the pits prepared and filled, no attention being given to the grooves, although they may be fissured? Such preparation can only result in failure, indeed, is a failure from the first, in that the fissures contain within themselves, micro-organisms which make progressive caries inevitable. There are few pits presenting on this surface, which do not involve, more or less, the grooves; they should be cut out, their edges carefully beveled and as perfect a filling as possible inserted, if decay is to be stopped.

Mesial and distal cavities, if not large, may be filled as in ordinary cases, but when a considerable portion of the surface, without great depth, is involved, good practice would seem to indicate their being carried over onto the occlusal surface, along the line of the grooves, for if the cavity extends on the occlusal surface to the pits, or nearly so, the same rule applies as in occlusal cavities.

Large mesio disto occlusal cavities, involving much loss of dentine with or without nerve destruction; this condition so often presented, is much more complex in treatment, as is often the source of much vexation of mind and spirit. How shall we treat them? As in the second class? Manifestly not! Yet how frequently are they so treated? Do we fully recognize the fact that a filling placed between the perpendicular walls is, in fact, a wedge, having no strength in and of itself, but is rather the agent of destruction, the forces of which must, sooner or later, be exerted? As the forces of mastication are exerted buccally and lingually, more than mesially or distally, it must needs follow that the buccal and lingual cusps, because of their prominence, are called upon to bear a greater strain, and if any method or system or cavity preparation will add strength, that method or system should receive our most careful consideration. Not con-

sidering the question of appearances; this being a secondary matter, we approach our subject and discuss it on the line of protection and preservation, this being in a great majority of cases, the first consideration. In all such cases, where occlusal force is exerted, we advocate the cutting off of the cusps at a point between their point and the neck, Fig. 1, sufficient to afford strength of material to withstand the force of mastication, beveling the edges toward the buccal and lingual, cutting down all frail walls, so that when the filling is inserted, we have the tooth encased within the walls of metal, Fig. 3, and the largest protection possible afforded. Of course the natural contour should be restored as nearly as possible. What material should be used? Because of its strength, hardness and durability, gold and platinum should be used to finish in a majority of cases. Color too, has much to do with the selection of this material. For the central portion of the filling, our judgment should come into play, but if the nerve has been destroyed, a pin anchored into each root, Fig. 3, will afford great strength.

In bringing the discussion of this last class of cavities to a close, permit me to call your attention to a few facts, which may have come under your observation, and if they have not modified your past practice, may furnish food for thought. You have been called upon to patch a large filling when the buccal or lingual wall had become fractured, more frequently the lingual perhaps. You have seen this tooth fractured along its central axis and you have been put to your wit's ends, to devise some means of repairing that which, if it had been treated according to correct principles, would have lasted yet many years. The school of experience is a costly one, yet if we heed the warnings she is so frequently offering, our professional path will have removed from it many thorns.

It was my purpose when this paper was commenced, to consider other phases of this tooth, but circumstances prevented.

HINTS.

BY DR. WM. H. STEELE, FOREST CITY, IOWA.

Vaporizing Medicine in Root Canals.—Any of the volatile remedies can be easily and successfully introduced in the root canal in the form of a medicinal vapor, in the following manner:

The rubber dam being adjusted, the canal cleaned and dried; saturate a pellet of absorbent cotton with the remedy you wish to use, and place it *loosely* in the canal; now with an ordinary hot-air syringe, force hot air through the cotton; which will vaporize the medicine, and carry it to all points of the canal, just as successfully as any of the high priced outfits sold for the purpose.

Repairing Rubber Articles.—When rubber articles in use about the office get torn or punctured, they are usually thrown away as worthless, while they can be made good as new, with little expense. If a rubber bulb or section of tubing, gets cracked or torn; take a coarse file and remove all dirt around the break, at the same time roughing the surface; put on a little "Major's Rubber Cement," and immediately apply a patch, cut from a piece of heavy rubber dam, and secure it in place until the cement sets. To repair the gas bag; rough up around the break with a file, cement on a patch of thin rubber dam, and when this has set, cement over it, a piece of thin strong cloth.

NON-COHESIVE GOLD FOIL AS A FILLING MATERIAL.*

BY C. H. GERRISH, EXETER, N. H.

It would be presumption on my part to offer anything in the way of instruction. I will simply relate to you my experience for the past twenty-five or thirty years in the use of non-cohesive gold foil as a filling material, and possibly some thoughts or suggestions may be of benefit to you in your practice, and if you receive what I have to say in the same spirit as it is offered no offence will be given.

There are teeth that cannot be saved by filling. You, as well as I, have met with them. Whatever material you use you will ere long wish your choice had been different; but granted that the quality of the teeth is such that filling will preserve them, you choose from the many materials some one.

In their order of merit I consider Hill's stopping, or some form of gutta-percha (the pink gutta-percha, such as used for base plates, is an excellent one) at the head; nothing equals it. Next in value comes tin foil. Third in the list I place non-cohesive gold foil; and last, cohesive foil, or any of the preparations of

* Read at the Vermont State Dental Society, March, 1895.

gold which require welding in their manipulations, while the plastics, such as oxychlorides and phosphates of zinc, are uneven and uncertain in their results, yet, nevertheless, indispensable. The amalgams come in to cover for us a multitude of sins, tiding us over many a troubled sea, and probably saving more teeth than any one of the above mentioned materials, and possibly more than all of them put together.

For the present, I will ask your attention to some advantages that non-cohesive gold possesses over the sticky form as a permanent filling, as the gutta-percha and tin foil respond too quickly to the wear and tear of mastication. It is a better stopping because it is a softer one. Why does the farmer plug the taphole of his cider barrel with a spile made of pine instead of hardwood? Simply because he loses no cider, there being no leakage. The plug must be as soft or softer than the material into which it is driven. Thus, when you put a non cohesive filling into a tooth, you have similar conditions prevailing. I think you will agree with me that it is not the most solid filling that preserves, but rather the one that is the best adapted to the inequalities of the cavity, especially the marginal walls, the one which excludes air, moisture and bugs, and yet hard enough on its surface to withstand the action of mastication. In all these desirable qualities soft foil stands foremost. Beyond a certain point you cannot make it hard. Though you will secure a very dense filling, it is like putty; though you work it ever so long, when you have finished your labors it is still putty. You have not changed the character of the material; you cannot pound the life out of it.

Again, the mechanical arrangement of the cylinders is more conducive to a perfect stopping.

Will you bear with me while I describe briefly my method of preparing the foil and working the same? I use both Nos. 3 and 4, nothing heavier. Take a sheet and fold two edges together, once, twice, three times, making a ribbon of eight thicknesses of foil, about one-half inch wide, then twist or roll this ribbon, being careful to keep the surface smooth of the coil. Now, with the scissors, cut the same into pieces just long enough to suit the cavity; by that I mean that one end of the piece shall touch the floor, the other projecting beyond the orifice. You begin your filling by inserting one of these pieces into one angle or corner of the cavity, so placing the same that the cut end of the gold shall

be at the bottom of the cavity, and condense into or towards the distal wall, another piece is placed alongside, and so on until you reach the opposing angle or corner. This reduces the size of the cavity. Continue in this manner until the cavity is full. Up to this time you have been using the sides rather than the point of your plugger, but now the point or end of the instrument comes into play by condensing your surplus gold, keeping the same well over the cavity. This is important.

Now, with a wedge-shaped instrument you begin your hunt for the weak places, sending the instrument well to the bottom of the cavity, using lateral wedging pressure. This act sends the gold towards the walls of the tooth. Fill up this pit, and look for another soft spot. After this take your burnisher and condense, as only a burnisher can; and right here, gentlemen, is the saving qualities of soft foil seen, for under the burnisher your surplus gold in a great measure disappears. What becomes of it? Every piece of foil composing the filling presents its edge or end to the action of the burnisher, and that instrument has forced, swayed, moulded or moved the plug in the same manner, but to a less degree, than the warm burnisher does your gutta-percha filling, bulging the walls outward towards the walls of the cavity, filling up every inequality, and secures for you a perfect stopping, for the more pressure you bring to bear on the filling the more perfect it becomes.

With a cohesive filling, how different is the effect of this instrument. You can make some impression upon the surface, the outside layers of gold; but the mass of the filling does not yield, and your work is finished for good or bad.

Again, non-cohesive foil can be used with a minimum loss of tooth substance, especially in approximal surfaces of the incisors. I believe and practise a free use of chisels and files. Soft gold requires it as much as cohesive, but the principle of wedging enables you to fill without cutting a direct opening to your cavity. Then you may maul and abuse your soft foil, not changing the working qualities thereby; but not so with cohesive, for it responds as quickly, resents any abuse, virtue goes out of it at the first impact of the instrument, and if it is hammered long enough you can get a spring-tempered filling, beautiful in itself, not easy in its surroundings. All this requires room or space, which is obtained in many cases by cutting through the outside, thereby

affording the operator a chance to advertise his skill, and fills his heart with pride.

This is not true art, for she conceals her methods, and the operator whose patients are recognized by their friends after a sitting is the true artist. Don't try to advertise your skill in showy work, but, as much as lieth in you, conceal it.

Personally, I regret that the methods of working non-cohesive gold foil are not taught in our dental schools.

I admit that it requires much time and practice to become an expert worker in soft foil, but think the benefits to be derived from its use warrant my calling your attention to it, and that you will encourage the young men who come to you as students to take up some method of using the same. The *virtue* is in the *gold* itself, not in any particular method.

One other point; as to the make of foil. I began with Abbey's soft foil some thirty years ago, use it to-day, and have always used it; and may I put some stress on this point: whatever foil you may select, continue its use, if it suits you, till you get acquainted with it. I takes about ten years to become real social with any make of foil, and twenty to make a lifelong friend of it. Please consider this seriously; there is much truth in it.

Finally, when you consider the difficulties under which the pioneers in dentistry labored—no rubber dam, no engines, no tools to speak of, and those without serrated points, no gold but non-cohesive—and see *such results* as many of them achieved, it is fair to presume that the principal merit lay in the gold itself.

Cohesive gold is used to obtain results not possible with the soft foil. They are beautiful in the extreme, enduring in all that goes to make a filling useful, enlarging our practice, and will not and cannot be given up. But, gentlemen, I firmly believe that the time is coming when non cohesive gold will share equal honors with its sticky brother.

MISSISSIPPI DENTAL ASSOCIATION.

ANNUAL MEETING, 1895.

Reported for OHIO DENTAL JOURNAL by Mrs. J. M. Walker.

THE Mississippi Dental Association convened in annual session in Jackson, Miss., Wednesday, April 3, 1895.

The meetings were held in that historic building, the State Capitol, whose golden memories of days gone by were eloquently portrayed by Capt. R. W. Banks, in his brilliant address of welcome.

He said " . . . This very building, constructed though it is of mute stones, is yet eloquent of the days that are dead, and of the men of renown who lived in those days. Its halls have resounded to the tread of sages, statesmen, soldiers, patriots. There is unheard music in the air—the echoes of "thoughts that breathe and words that burn." These walls have resounded to the eloquence of the silvery tongued Prentiss, to the golden cadences of the brilliant McClurg, and to the thunder of Lamar's eloquence as he built up the solid masonry of argument and fact, and garlanded the same with the sweetest flowers that bloom in the garden of Parnassus. Here, Jefferson Davis, the unthroned king, whose empire was the hearts of his people . . . has commanded the applause of listening thousands, . . . If these silent stones could but speak, what tales they could tell of Andrew Jackson; of Henry Clay, the sage of Ashland; of Richard M. Johnson, Ex-Vice President of the United States, the slayer of Tecumseh the Pawnee chief; of Louis Kossuth, the Hungarian patriot, and of other distinguished liberty-loving guests of Mississippi, whose feet in the long ago trod and made sacred the soil your feet to-day have pressed."

DENTISTRY A NOBLE CALLING.

He said, The honor of welcoming you could not have been conferred on one who more highly appreciates the splendid results you have achieved in the cause of humanity. The noblest callings of man—those which render him most God-like—are, I hold, those whose duties demand of him the dedication of his time, talent and energies to the relief of suffering wherever found. In your profession, gentlemen, I recognize such a calling, for are not your best efforts directed to the alleviation and prevention of pain? I would that I had words in which to express, in terms fitting to the occasion, the obligations of our race to the dentists of the world, for the good they have accomplished.

ANTIQUITY OF THE DENTAL ART.

There is another noble calling which claims to be superior to yours and which traces the genealogy of its science back through

classical literature and tradition, to the days of Mythology . . . But long before we have any account of *Æsculapius*, teeth were filled. We have, it is true, no account of whether the mummies, from the catacombs of the Pyramids, died of too much or of too little medical attention, but this we do know; specimens have been found with teeth well filled, conclusive evidence that the dentist was not only able to be up and around, but was actually getting in his work, and preserving teeth, even in the days that are heavy with the dust of full forty centuries. . . .

MEDICINE VERSUS DENTISTRY.

But what care you for the pills and potions of the learned M.D.'s when the record bears it out that you have "the pull" on them. What do they know of metallurgy or the "relative value of gold and silver" to be used as commodities in "tapping the roots" of pain? In these days of mono-metallic tendencies, is not your advantage manifest, when it is borne in mind that you keep both "gold and silver circulating" and, independent of party, dictate the "ratio" as well as the prices, and "maintain the parity" at which the metals shall be used (in your profession)? Do you not deal in them as commodities, and at a price fixed by you? as a preventive of aches as well as a "medium of exchange" at your own sweet will?

DENTISTRY THE JACK-AT-ALL-TRADES IN THE PROFESSIONS.

Do you not more frequently and more profitably, deal in "plugs" than does the average *horse jockey*? . . . Do you not make more by "constructing bridges" than any *contractor* in the country, when the size of your structures is taken into consideration? Do you not *raise* smaller "roots" and fewer of them than any *market gardener*? and you get more per "root" for all you raise than the best gardener gets per peck? Do you not oftener work on "crowns" than do even the *jewelers* to royalty? Who but a dentist can "bleed" a majority of his best customers, and yet retain the good will of the customers bled, while continuing the bleeding process whenever opportunity offers?

THE DENTIST IN NATURAL HISTORY.

In your profession may sometimes be found *rare birds* in the shape of men. Take for instance, my old-time-friend, that genial christian gentleman W. W. W—, of Columbus. God bless him.

May his tribe increase! and you will indeed find a "*rara avis*." Ornithologists place him as belonging to the genus *Pelecida*, of which the common woodpecker is a species. Note the characteristics of *these two birds*. The woodpecker is readily distinguished by his red head; so is W—! While the woodpecker "bores" for a living, W— never *bores* anybody, though he too "bores" for a living. The woodpecker, however, works in the "cavity" only for himself; W— works for the good of others. The woodpecker works with his own head; W— works on the head of others . . . The honest woodpecker presents his bill for boring, before he goes to work on his job, and leaves the cavity open for the inspection of whom it may concern; W— bores first, and does not present his bill for boring until he fills the hole, and then it is made clear how much more industrious, not to say open and honest is the one over the other. The cavity cleaned out of the one is always large in proportion to the bill presented; the reverse is the case with the other; the "cavity" in the case of the last is small, but no bird, not even the pelican, ever boasted of a bill comparable in size to that the dentist sometimes presents.

A GENEROUS WELCOME.

Come as you will, and come as you may, you will find loyal hands and kindly hearts to receive you. While with us, it is yours to command us, as you will: in the path or out, first, last and all the time, silver or no silver, prohibition or no prohibition, democrat or populist, administration or anti-administration, woman's suffrage or what not; no matter what your politics or what your religion, your wishes and wants, hopes and aspirations—we are ready on demand to deliver up to you the keys to the city, to our homes, to the wine cellar." . . .

After a brief but hearty response to these cordial words of greeting, by Dr. Westmoreland, the President of the Association,

Dr. W. E. WALKER, Pass Christian, read the annual address.

After the customary words of greeting and congratulation, he said:

"The speakers to whom we have listened, have given us feasts of eloquence and oratory.

We look forward to the essays prepared by the Chairman of Sections, and to their discussion, for our advancement in scientific and professional wisdom.

I will not attempt to rival the former in eloquence, nor to forestall the latter in scientific lore, but will confine myself to a few practical suggestions which appear to me as of importance at this period of our existence as a Dental Association.

We meet, to-day, for the first time, as a *chartered body*, under authority of a charter obtained by a committee appointed by the Mississippi State Dental Association, at the meeting in April of 1893—the signatures of the Governor of the State, John M. Stone, and of the Secretary of State, George M. Govan, bearing date May 11, 1893—the committee having lost no time in performing the duty assigned them.

As, owing to various circumstances, the attendance at the meeting held in Natches, last year was small, I judge (from that and other reasons) that some of those present to-day, are perhaps not as well-informed as should be the case, in regard to the important items of business transacted at that meeting.

Before proceeding further, I would ask that all those present who have received the transactions of the last meeting, which includes a copy of the charter, and who have received the revised constitution, and who have familiarized themselves with the provisions of our charter; the essential features of the revised constitution; the circumstances necessitating the change in the name of our Association; the status of the members of the old Association in regard to back-dues, charter-membership, etc., to please raise the hand.

The proportion being so small, allow me to suggest that every one who has not done so, would secure a copy of the charter, and study it, that you may know and understand our powers, privileges and liabilities as a chartered body."

In regard to beneficiary scholarships, conferred by some of the dental colleges, he said: "It is becoming too much the custom for applications to be made so late that the responsibility rests upon the President, acting *ad interim*.

Certain of our dental colleges, as an inducement to worthy young men, of limited means, offer beneficiary scholarships to one young man from each State.

Heretofore we have recommended beneficiaries to only four colleges, the two in Baltimore and the two in Atlanta. Having been obliged to refuse a number of applicants, who were well recommended, but for whom there existed no known vacancy, I

have investigated the matter a little and find that, in addition to the four colleges named, the Northwestern College of Dental Surgery (Chicago) and the Birmingham Dental College (Alabama) also receive beneficiaries. I mention this for the benefit of those whose application may be filed too late to receive appointment to the four heretofore on our list.

Special inducements to studious young men are offered by the Louisville College of Dentistry, a scholarship prize, cancelling the Professor's fees for the ensuing year being granted to the Freshman and to the Junior, standing the best examination at the end of the session, provided their mark is over 80.

The Ohio College of Dental College also offers a similar prize of the Professor's tickets for the Junior year, to the Freshman student who passes the best general examination.

The New York College of Dentistry gives six honor appointments to the infirmary staff, as démonstrators for one year, with a salary of four hundred dollars for four hours daily attendance—drawn from the best practical workers from the graduating class of each year—three for service in the operating department, and three in the *prosthetic* department.

The Dental Department of the University of Medicine, Richmond, Va., gives reduced rates to the sons of ministers, physicians, and dentists of limited means, on properly guaranteed certificates of inability to pay the regular fees. It is thus seen that the Dental Colleges offer assistance and encouragement to young men of limited means, who desire to prepare themselves to enter the profession of dentistry.

In regard to offering inducements to young men to join their State Dental Association, he said: "I would call your attention, in this connection, to a resolution adopted by the Georgia State Society, by which these young graduates who, in addition to the cost of their college course, have just incurred the expense of going before the Board, and who need every dollar to fit up an office—may become members of the Association by simply giving a promissory note, payable, say in two years, for the amount of initiation fee and one year's dues.

It is our duty to offer these young dentists every inducement to enroll themselves in our ranks, that they may enjoy the advantages of associated work, and thus prepare themselves to take the places of those who year by year are seen no more among us.

By thus early placing in their hands, a copy of the constitution and by-laws, and the code of ethics, to which they must subscribe on joining the Association, many of them may be led into, and kept in the right path, who, if allowed to go back to their homes with only the promise—and no doubt the honest intention—of joining us when better able to meet the expense, might, in the bitter strife of competition, without this restraining influence, go so far astray that we may never win them back to the path of professional honor and integrity.

. . . . The honored occupant of the chair, at the Natchez meeting, offered the following suggestion, to which I wish to direct your attention again, and recommend it especially to the members of the Legislative Committee.

I quote the words of our Ex-President Dr. J. B. Asken : "There should be a law in our state exempting dentists from jury duty, road duty, and militia duty."

The subject of jury duty for the dentist was ably presented before us, on the floor of this hall, by our lamented brother, the late Dr. C. W. Robinson, of Magnolia, whose removal to a higher sphere of duty calls for suitable recognition on your part.

To the Committee on Legislation I respectfully submit that an endeavor be made to secure the passage of a law making malpractice (in dentistry, and possibly medicine and pharmacy, as well) a *misdemeanor*, the penalty for the same to be forfeiture of state license to practice.

I also direct your attention to the suggestion made by Dr. Asken, that "such steps be taken as will bring before the proper authorities the necessity of employing dentists in the army and navy."

At a subsequent meeting special points in the President's address having been reported back to the Association for discussion, a resolution was adopted, by which young men who apply for membership in the Association, at the same meeting at which they pass the Board and obtain license to practice, are allowed to give their personal note for the amount of initiation fee and dues for one year.

The President's suggestions in regard to jury duty, militia duty and forfeiture of license as penalty for malpractice, were referred to the Legislative Committee with power to act. Each member of the Association was made a "committee of one" in

the matter of influencing Congress in the matter of the appointment of dentists in the army and navy.

Dr. C. L. Alexander, Charlotte, N. C.; D. R. Stubblefield of Vanderbilt University; Frank Holland of Southern Medical College, Atlanta, Ga.; Wm. Crenshaw and J. P. Hinman, Atlanta Dental College; J. Y. Crawford, University of Tennessee, being present, were presented to the Association by Dr. B. K. Luckie, as gentlemen of state and national reputation, to whom the Association desired to show honor in their election to honorary membership.

The part taken by these gentlemen in the subsequent discussions of practical and scientific questions added very greatly to the interest and value of the proceedings.

(To be continued.)

ILLINOIS CORRESPONDENCE.

GOSSIP ABOUT THE ANNUAL MEETING OF THE STATE SOCIETY JUST HELD.

DEAR DOCTOR:—The principal professional event of the year in the state, has come and gone. I mean the annual meeting of the State Society. You know we pride ourselves a good deal on our Society; we have an idea there never was just such an organization. The meetings are always so interesting, always profitable and in some way or another make an epoch.

This year it was held at Galesburg. The attendance was a good average. Though some familiar faces were absent, Harlan, made his first miss, I believe since he became a member, and failed to post us on coagulants. You may be sure he had the best of excuses,—sickness in the family. A few other old wheel-horses, too, were conspicuous by their absence, but Cushing, the Nestor of the Society, took his accustomed place. Uncle George as he is affectionately known by his intimates, has never missed a meeting since its inception, 30 years ago. In many ways he is a worthy example to society members. He is always present at the first sound of the gavel, prompt in his attendance at the sessions, a good listener, always ready to come into a discussion if needed, never prolix, always interesting and level headed, courteous, kind and encouraging to modest worth, so that like his illustrious namesake, he has truly entrenched himself first in the hearts of his fellow members.

Dr. Black, G. V. you know, is another favorite with the society. He does not take much interest in the routine business, but when it comes to discussions on scientific subjects, he is always there. This time he brought some of the machines he is using in his investigation of the physical character of teeth and filling materials. From the startling character of the facts already developed, and the scientific thoroughness and accuracy of his researches, the results I am satisfied, as one gentleman expressed it, will not have been equalled in importance since Miller gave his researches on microorganisms to the profession. Black, unlike so many of his confreres, never talks until he is fully prepared to talk, so that when he makes an unqualified assertion you may be sure he is fully prepared to back it up with facts. For instance, he showed a machine to illustrate the crushing force required to masticate different articles of food. It is beautifully constructed, and as it chewed up some tough steak, provided for the occasion, registering with each chew it made, just the amount of force required, it did seem as though, if it were only supplied with a set of salivary glands, one could have his chewing done for him. Doctor Reid, of Chicago, who was an interested bystander said, "This is good as far as it goes, Doctor, but here you have only the vertical motion, your machine has no grinding motion, which would modify the force required in chewing such a steak as that. Hence this registration is faulty."

It did look as though the Doctor had been caught napping for once, and that apologetic explanations would be in order. However, looking up with a smile at the speaker he quietly said, "My friend, do you chew meat with a grinding motion?" "Certainly I do," was the positive answer, "I never chew otherwise. Everybody uses lateral grinding motion in chewing," and he proceeded to illustrate. "I think" was the answer, "you had better study the process and see whether you do. Cereals we crush with a lateral motion, but meats we masticate just as you see this machine do it," and then followed a disquisition on the jaws of the carnivora which are hinged so that vertical motion only is possible. Showing fully that the good Doctor had given that phase of his subject a good deal of thought, and that he hadn't been caught napping after all. His investigations with amalgam will startle the profession when published. Preconceived ideas on this subject which have been accepted generally, without

question, will be knocked into cocked hats. The Doctor's experiments are still in progress, and a number of problems are yet to be solved, so that only hints of what is being done are given, but sufficient is known to say that the results are intensely interesting, and on the amalgam question a good many of us will have to reconstruct our beliefs and theories. The society from the little revealed, thought enough of it, to put two hundred dollars at Doctor Black's disposal to help in part defray the expenses of the investigation. A good move.

The papers presented were a good average in quality, some of them exceptionally good.

An innovation was made in devoting an evening session to the President's address, to which the public were invited. "The Saving of the First Tooth," was the subject, and opportunity was taken to deal out large chunks of good advice to the public. The medicine was sugar coated, that is, made entertaining, and the idea took immensely.

Cattell of Chicago, put the society into a very reflective mood, by exhibiting some results of experimental root filling. The specimens submitted were very comprehensive, embracing most of the orthodox methods in vogue; the root canals afterwards being exposed, and submitted for inspection under a magnifying glass. The result was shocking to those who were sure they never put in anything but a perfect root filling. As Cattell is known to be a skillful operator, the imperfections could not be attributed to slovenly manipulation, and it is safe to say a perfect root filling in the mouth will hereafter be inseparable from huge interrogation points by many of his hearers.

About the most exciting of the discussions was on Dr. Koch's paper, which dealt with the imperfections of our present dental law. Dental legislation in this state is a very ticklish subject. The present law is admittedly a very lame affair, and for ten years efforts have been made at each session of the legislature, to have a better one passed, so far with no success, simply because we have not been able to agree among ourselves as to its provisions. Consequently we all have opinions, and very strong ones too, and they are all different. So that alone, would make the discussion very interesting. But there is still other elements. You know Chicago is a city of dental colleges. It is said, that it is safe to call every other dentist you meet there, Professor. As

a matter of fact twenty-four charters for dental colleges have been issued by the state authorities. Of course not all these are in existence, but enough of them are, to make the rivalry intense. As the State Board of Examiners under our law, must pass on the standing of these colleges, must call some of them sheep and others goats, and as some of the sheep occasionally develop incipient beards and horns, which it is the province of the Board to suppress, you can readily see what a diversity of interests are at play. Whenever a new law is proposed the Board tries to be relieved of the duty of judging between colleges, and of disciplining infraction of the rules, by examining all candidates without inquiring where they were qualified. The colleges on the other hand who are in the reputable fold are loth to give up the advantages they have, and decline to accede to the changes asked. The State Board is too good a club, as it now stands, to drive students to them, and it is so nice to be able to use it to club a rival for trying to play it a little too fine. So when a man like Koch, who is probably one of our best posted men on legislation and education, is announced to read a paper, some of the colleges are apt to get a little nervous over what he is going to say. For he has been so closely identified with the history of legislation in the state, and was a member of the Board for so many years, that he has become very familiar with some of the devious ways of some of our educational institutions, and knows so many things it would be rather awkward to bring up, and he is withal so fearless, they are not quite sure how far he may go. On the other hand, the Board has been doing some things which apparently are not beyond criticism, and the professors were on deck with plenty of ammunition for a lively scrimmage. The paper a very able, thoughtful production, however on the surface was innocent enough, but to a man up a tree, who understood the situation, it was full of possibilities for deviltry. It confined itself closely to a caustic arraignment of the crudities and inconsistencies of the present law; and made a strong plea for improvement, on lines laid down according to his experience. The principal provision to which Brophy, who opened the discussion, objected, was the qualification clause, the Doctor giving it out cold, that he would always oppose any law which did not discriminate between reputable and non-reputable colleges; and claimed that colleges were not the money-making institutions they were thought to be, but

were actuated only by the highest and noblest motives. This brought out Stevens, who has a grievance against one of the colleges. He mentioned no names, but made some pretty tough charges. For a time it looked as though there was "blood on the face of the moon," and that he was about to sit down hard on the dynamite which every one felt was lying around loose. However, if he stepped on any one's corns they simply winced and said nothing. "Dental Protective" Crouse squirmed around in his chair like a chestnut in a hot skillet, his eyes snapping like a terrier's on the *qui vive* for a scrimmage, expressive smiles lighting up his phiz at telling points. He was evidently loaded, and held himself in check with difficulty. Altogether the discussion was very funny. There was an air of repression and expectancy about it. Every one plainly carried a chip on his shoulder, but evidently reserved his best ammunition until some one would knock it off. The chips, however were not knocked off, the dynamite was not exploded, some bunions were stepped on, and stepped on hard, but it was done under the table, and only those who were on the inside saw it, and saw the flinch, and the discussion closed in apparent good feeling. The society took no action either for or against the law, which is now before the Legislature for action. Evidently thinking there was no chance for it this year.

The clinics and exhibits were very interesting. Your own Custer was on hand and demonstrated how to fuse porcelain by electricity. Taggart of Chicago also exhibited his electric furnace, which he has been developing for a number of years. These men will undoubtedly revolutionize the present laboratory methods. Taggart is already applying it to fusing metals as well as porcelain, and is constructing a furnace for Dr. Black, to fuse metals under conditions precluding oxidation.

The old fashioned gas and coal evidently must go.

Antes of Geneseo, had an articulator, a very neat improvement on the Bonwill, which reproduces almost perfectly every motion of the human jaw.

A gasoline generator and blow-pipe, unique and neat, with a range of possibilities not often met with, was another of his exhibits which attracted a great deal of attention. In my judgment the apparatus is an improvement over gas for blow-pipe work. It is certainly more economical.

Ames of Chicago, demonstrated his method of making gold inlays; using pure gold plate No. 36 for a matrix, and sponge gold to form contour, fusing No. 22 k. solder over all. The completed operation which I had an opportunity to examine was very artistic. A celluloid matrix especially adapted to cement fillings was another novelty exhibited.

Reid of Chicago exhibited another Ohio idea by showing how to enlarge root canals with sulphuric acid. One of our lady members, Dr. Josephine Pfiefer of Chicago, demonstrated by a clinic that skill in making and adjusting crowns, is no longer a monopoly of the tyrant man.

After all, clinics are very unsatisfactory. The interesting ones that you care especially to see, always have such crowds about them, that without being rude or pushing some one else out of the way, who has just as much right there, you are effectually barred out. And suppose by chance you do get a good position, if you are invited to move on after a short time in order to give others a chance, and you are gentlemanly enough to do it, what good is there to be desired from a fleeting glance at an operation, the principles of which can only be grasped by seeing it in its entirety. I can see no remedy however.

The society after electing the jovial Stevens of Chicago, President, adjourned to meet next year at the State Capital, Springfield, where we would like to see you Doctor, and as many of your readers as possible.

ZEBEDEE.

ALL SORTS.

A Suggestion.—Does your pyrozone get away? Is there odor of ether about the bottle? Powder an old corundum point and moisten with water. Revolve the glass stopper, charged with this powder, forcibly in its socket. In three minutes you will have a perfect fit.—*J. P. Anderson in Items.*

A Practical Way of Drying out a Pulp Canal.—After wiping out the canal with alcohol, I place a nerve broach as far up in the cavity as I can get it, and with a hot air blower draw in the flame of a spirit lamp and blow the hot air on the broach just where it enters the canal; do this several times till the broach gets hot, and it will dry out the canal thoroughly.—*R. R. Vaughan in Items.*

Treatment of Hemorrhage after Extraction.—Dr. L. Van Orden says: "I have found glycerine and tannin very successful, as it forms a strong clot; the glycerine, having a great affinity for water, leaves the tannin better able to form the clot. I use it a great deal when adjusting crowns. We frequently have annoying hemorrhages of the soft tissues during these operations and I find glycerine and tannin invaluable."—*Extract Pac. Coast Dentist.*

To Back Porcelain Teeth in Bridge-Work.—Back with very thin platinum and place a compressed cylinder of gold between the platinum and the porcelain, burnishing proximately. Grinding off to a feather edge brings it into perfect contact, and the solder follows the interstices of the gold cylinder under the platinum, the solder flowing without burning the gold. Grind down with very fine corundum stone.—*W. G. Browne, Atlanta Dental Journal.*

Gum Acacia and Plaster.—Mr. E. Lloyd Williams advocates the addition of a solution of gum acacia to plaster when used either for casting models or for taking impressions. When using it for the latter purpose, he adds about an ounce of the Mucilago Acaciæ (B. P.) to the pint of alum solution. For casting models slightly less is required. Mr. Lloyd Williams states that this addition renders the plaster less friable, and more dense, giving it a silky look.—*Dental Record.*

Cocain a Poison.—The evidence to prove cocain a poison is now so ample that no excuse will avail to exonerate the doctor who, not heeding the lesson taught by the gruesome record, fails to use it with the care its toxic energy demands. It is a drug peerless for good in certain conditions, but its power for ill must never be lost sight of, if one would conserve the best interest of those on whom it may seem wise to use it.—*J. B. MATTISON, M.D., in American Medico-Surgical Bulletin.—Cosmos.*

To Polish Ash's Mineral Teeth.—Mr. William D. Quinn, L.D.S. of Johannesburg, says: "When I find it necessary to cut the surface of your mineral teeth I finish the cut surface with a fine corundum wheel, and water-of-ayr stone in it. I then polish it with fine pumice, and complete the process with whiting on a hard beech-wood wheel about a quarter of an inch thick, which I have had made for the purpose. This method, I find, brings up a beautiful polish, almost equal to the original surface."—*Ash Quarterly.*

Bridge-Work.—I have been in the habit for some time of substituting keoplastic dummies for gold or porcelain in bridge-work where they would not show, and more especially where there was very little space. I first fit the crowns, solder one or two bars of gold or platinum from one crown to the other, fit them in place, remove them with an impression,

place them on an articulator, mold and contour waxed teeth to suit, flask and run metal. This gives a solid, desirable bridge, cheaply and easily adapted.—*M. M. Cullum in Items.*

To Preserve Gutta-Percha.—Mr. W. H. Coffin says “that if the material is placed in glycerine it will keep good for an indefinite length of time. He uses an earthenware jar with lid for this purpose, but any other vessel having a wide mouth will serve equally well. Mr. Coffin further states that gutta-percha for impressions should, when cold, bear being twisted about as readily as a piece of leather without cracking, or it is not fit for use. He obtained beautiful impressions with the material.”—*Ash's Quarterly.*

A New Alloy as a Substitute for Gold.—The *Journal de l'Horlogerie* states that an alloy has been discovered which is a wonderful substitute for gold, its composition being copper nine parts, antimony six parts. The copper is first melted and the antimony then added; when thoroughly fused together a small quantity of magnesium and carbonate of lime are added to increase the density of the metal. The product can be drawn, wrought, soldered, just like gold, and on being polished almost exactly resembles it. Exposure to ammoniacal salts or nitrous vapors has no apparent effect upon the alloy.—*Jour. Brit. Dental Association.*

Articulation for Crowns.—After the band is fitted and in place, mix a little plaster just thick enough not to run, then take a little on the end of your mixing spatula and place in the mouth, covering the band and one or two adjoining teeth, then have the patient close the mouth and keep it so until the plaster sets. When set, have patient open the mouth and if the plaster cannot be lifted off easily, just break in center and remove the two halves, then wax together, put band in place, and varnish and fill as you would any bite; but before filling bite fill the band with wax, then when you separate the bite you will have no trouble in lifting the band from the model.—*Dental Digest.*

An Excellent Idea.—In the *Dental Practitioner and Advertiser*, Dr. S. E. McDougall says:

“Prof. Barrett, in his lectures at the University, lays special stress upon the importance of sterilizing dental instruments, and when he has a case of syphilitic character he compels the patient to buy a set of new instruments for the special operation he is about to perform, and never uses them on any one else. I think we would all do the wise thing to heed this lesson well.

Instrument Sterilization.—Dr. Smith, a dentist and also a practical chemist, connected with the university at Buffalo, uses the following method to sterilize his instruments:

"After wiping debris off the instruments, place them in a vessel containing peroxid of hydrogen, and allow them to remain until effervescence ceases, the peroxide removing all infections. Then place them in a ten-per-cent. solution of thymol, into which put a few drops of oil of cassia, to give it a pleasant odor. Thymol, according to Miller, of Berlin, is an excellent germicide, and its use makes the instruments thoroughly aseptic, deodorizes them and keeps them thoroughly clean. This method requires only a few moment's time, and the results are very satisfactory.—*S. E. Macdougall, in Dental Practitioner and Advertiser.*

Sodium Peroxid.—I am indebted to Dr. William H. Trueman for a suggestion which has been of very much value to me in the preparation of the sodium peroxid solution. Dr. Trueman advises that the inner soldered lid of the can in which sodium peroxid is dispensed be perforated by means of a fine engine drill with a number of small holes, somewhat like the lid of a pepper caster. By means of this device the powdered peroxid may be gradually sifted into the cold water in making the solution. By replacing the outer screw-cap lid the contents of the can do not undergo change by absorption of atmospheric moisture, as is quite likely to be the case where the soldered inner cap is removed to gain access to the material.—*EDWARD C. KIRK, in Dental Cosmos.*

A Caution.—The conservative practitioner who keeps pace with the changes in methods of practice will, we think, agree with us in this proposition, viz., that alveolar abscesses will increase in frequency in proportion to the number of practitioners who follow the practice now being advocated of leaving the pulp, after being devitalized, in the roots of teeth, and making no attempt to fill them. So must there be a greater increase of trouble following the practice of immediate root filling, instead of the method of frequent treatments before filling, where the pulp has been dead for a considerable length of time. These two methods being advocated in so many different quarters, we wish here to sound an alarm and enter a protest against such practices.—*Dental Digest.*

Combination Cement and Metal Fillings.—Where considerable wear is to come on a cement filling, aluminum filings may be added to the powder before mixing, in equal bulk, and thoroughly incorporated and the mixture made as usual. If the above cement or any first-class cement is used, the addition of the aluminum filings will not materially detract from the working qualities of the cement. After setting, the filling should be finished with disks and the surface thoroughly burnished. It will present a metallic surface and will withstand attrition fully equal to a metallic filling. In time it may need reburnishing, but if an occlusal surface the ordinary use will keep it polished.—*W. X. Sudduth in Southern Dental Journal.*

Cements.—The field for usefulness of cement as a filling material is largely confined to temporary or test work and intermediate or in combination with some other material. We have advocated the use of a cement made by Dr. Seikel, of San Francisco, which seems to present some excellent qualities. The formula is as follows:

Powder.—Chemically pure zinc is made with a portion of oxide of zinc and oxidized by keeping it at a white heat for from six to ten hours. Then add phosphate of aluminum until the mixture is of the consistency of putty, then bake till it is fully fused, when it looks like porcelain; then pulverize finely.

Fluid.—Add aluminum to chemically pure glacial phosphoric acid and boil down to the consistency of syrup.—*W. X. Sudduth in Southern Dental Journal.*

Mica as a Matrix Material.—An oiled mica matrix, by virtue of its extreme thinness, smoothness, flexibleness, resistance to acid actions and shapability with scissors, to say nothing of its cheapness, leaves little to be desired of a readily applied and removed cavity-wall. It may be ligated or otherwise secured around the tooth; as, for example, by heat-softened gutta-percha pressed against it on either side between the teeth. With due care in adjusting the matrix, no subsequent finish will be required.

The elasticity of the mica matrix suggests discretion to avoid its accidentally springing into the mouth, and its friability renders caution requisite to prevent the leaving of broken pieces between the teeth. Of course when the rubber-dam is in position, neither of these considerations will be in point.—*W. S. How in Dental Cosmos.*

Aluminum Successfully Hardened.—"It is stated," says *Industries and Iron* "that the successful tempering of aluminum, so as to give it the consistency of iron, is a discovery of F. Allard, of Quebec, whose re-discovery of the lost Egyptian art of hardening copper startled the mechanical world three or four years ago. He has made and hardened a cannon, which has just been tested in the presence of Col. Spence, the American consul, and a number of others, with success. This cannon is 28 inches long, 5 in. in diameter, the metal outside the bore being only $\frac{1}{4}$ in. thick. A charge consisting of a pound of powder was fired out of this without any appreciable effect upon it. Allard has been asked to manufacture as soon as possible a cannon 12 feet long, for direct shipment to Washington."

To Make Dies for Small Cases Without Molding.—The method in brief is to cast the dies directly on the model which may be easily and quickly done, thus:

A plaster impression being taken, a plaster model is obtained. With the tip of the finger dipped in powdered soapstone rub the model till smooth; build a wall of moldine (potter's clay mixed with glycerin) half an inch high around the model, covering the teeth and all parts not to be covered by the plate; the parts to be covered by the plate will then be at the bottom of a well with sloping sides; in this well pour lead till it is even full; the lead should be poured just before it begins to cool; separate this lead counter from the model, and around it build the wall of moldine as before, leaving exposed the surface only to be covered by the plate; with a ball of cotton held in the pliers and dipped in powdered soapstone, dab the surface of the exposed lead till it is covered by a film of the fine dust; in the well thus formed pour fusible metal, separate and swage as usual.

By this method no time is lost making sand molds, varnishing casts and waiting for them to dry, and the results will be found exact and satisfactory in every way.—*R. R. Vaughan in Items.*

A Method of Root Canal Filling.—"Take a canal whose foramen is somewhat large. This we know by the easy passage of our instruments; although many a good operator will say if gutta-percha passes through the foramen it will do no harm. I am obliged to differ; anyway I will say it certainly is better to prevent it if possible. Take a small piece of floss silk, wet in gutta-percha dissolved in chloroform the consistency of cream. Thoroughly saturate it. Now, with a napkin, gently press out surplus and carry on end of your plugger and push into place. Too large a piece will end in failure; you must be careful. This will fill the end of the root and not go through. The fibers of the silk prevent the instrument from pushing through. Fill the balance of the root the same way for a short distance, thereby having sufficient to prevent, when balance of filling is put in, from pressing too hard on the first plug. I have heard it said that in time this silk will become infected. Not so, for the fibers are imperviously covered with gutta-percha.—*C. W. SYLVESTER in Pacific Coast Dentist.*

A Method of Adjusting the Logan Crown.—Having prepared the stump, drill a number of small holes as near the circumference as possible. Cut these together, and you have a groove for the reception of band. This band should extend to the bottom of the groove, say one-sixteenth of an inch; then grind the band level with the face of the stump. Cut a disk from 29 gauge gold plate, fit over the root burnishing thoroughly; remove the band and cap and flow a very small quantity of solder to unite them. You can readily see how to replace disk on band. Replace the soldered piece and drill or puncture for the reception of the

pin, and adjust your crown. You can remove and place the cap on the crown and flow a small quantity of solder around the pin, making it all one piece, or cement without soldering.

If it is desirable to work from a model, take an impression, after the groove has been cut in the root, with Melotte's compound, and make a metal die, and proceed as before. I claim for crowns adjusted in this manner that they are less bulky than the ordinary band crown, absolutely cleanly, no trouble from pericementitis, and no gold will show. I think the profession will appreciate this way of setting Logan Crowns.—T. M. JAMISON, *Dental Cosmos*.

As Viewed by Others.—The American journals, just to hand, give an interesting account of the meetings at Hartford, Conn., to celebrate the semi-centennial of modern anesthesia. Most of our readers know that a tablet has been erected in that city in memory of Horace Wells. The oratory, of which this event has been the occasion, is somewhat remarkable, not only for the many happy thoughts and expressions to be found therein but for the somewhat unequal manner of its flight. We are sometimes carried out of ourselves by the pictures drawn of the benefits accruing from the use of anesthesia, and anon left floating in mid air, wondering where we are, and what it's all about, and if it is not perilously near pathos. But it seems to us a pity, at this late hour to drag in any discussion as to the relative claims of Sir Humphrey Davy and Horace Wells. Facts are facts, and they are simply these, that Davy knew something of the effect of inhaling nitrous oxide, but his work and his thoughts were directed to other ends than the discovery of an anesthetic for dental or surgical purposes. The chemist tells us the property of drugs, the physician sees the application. Horace Wells was the happy man to see and to teach the use of nitrous oxide as a narcotic agent.—*Dental Record*.

A Method of Attaching Gold Crown by means of a Screw and Nut.—At an English society, Dr. Herschell gave a demonstration of this method, a brief outline of which is as follows:

A gold collar was fitted in the ordinary way. The pulp-chamber was deepened and enlarged so that the floor was quite flat and the sides slightly diverging. The collar having been placed on to the root, gutta-percha was packed down tightly, filling the collar. Into the gutta-percha the patient was allowed to bite, so that the impression of the opposing teeth was obtained. The collar was then removed with the gutta-percha *in situ*, an exact impression of the enlarged pulp chamber being thus gained. After a cast and over-bite had been made the gutta-percha was removed, leaving a *facsimile* of the root with the collar in position. A

piece of platinum plate was then fitted to the model, so that it exactly filled the floor of the pulp chamber, and into the center of this, and perpendicular to it, was screwed and soldered a portion of platinum pin wire, into which a screw thread had been cut. After the crown was made a hole was cut in the top so that when placed on the model the pin would protrude exactly in the center. Into the thickness of the top of the crown a depression was now cut just deep enough to allow for the thickness of the nut, which filled the depression exactly. The flange of platinum, with pin attached, was then fixed into the root with amalgam, and allowed to remain until the amalgam was hard. The crown was then filled with cement and pressed on to the tooth, after which the nut was screwed home and the projecting end of the pin cut down flush with the nut.—*Extract Journal Brit. Asso.*

A Simple and Rapid Method of Banding the Logan Crown Without the Use of Solder to Attach Crown to Band.—To simplify matters we will suppose we are to band a superior central incisor.

Prepare the root to be crowned as for any band crown. Make a band of twenty-two carat, 29-gauge gold plate to fit the root of the tooth. This band should be decidedly larger at one end than at the other, the small end fitting the root, and being wider on the lingual or palatal side. Drive the band on the root, and mark on the inside all around, the distance the root comes up into the band. Remove the band from the root, and burn into a block of wood up to the mark where the root stops. Drill a hole in the wood in the center of the band so as to allow the crown pin to penetrate the wood. Select a Logan crown, grind and align it in the mouth, remove the crown and force it into the band which remains in the wood, reducing the circumference of crown, if necessary, by grinding. Place in the improved Hollingsworth crown contour press, and force the crown into the band until it strikes the wood. Now with a heavy burnisher burnish the band to the palatal surface of the crown, clear over the palatal curvature.

Remove the band and crown from the wood, and you will find they are fast together. Trim the band to a feather edge with corundum stones, always grinding towards the cutting-edge of the crown, and leaving the band wide on the approximal surface and narrow as desired on the labial surface. If these rules be followed, the band will be so tight on the crown as to make its removal a matter of difficulty.—THOMAS P. HINMAN, in *Dental Cosmos*.

Aluminum Soldering.—Dr. Richardson, in the *Aluminum Age*, says:

“The only solder for aluminum which has attained to any extensive

use, and which may be said to be the most successful thus far invented, is that of Mr. Joseph Richards, of the Delaware Metal Refinery, Philadelphia. Mr. Richards found that by adding a small per centage of *phosphorus* to the best solders hitherto used, they were invariably improved, the particular point of advantage being their increased ability to bite on the aluminum. The best alloy thus prepared contains zinc, tin, aluminum and phosphorus, the first two constituting the bulk of the alloy, and being united in their chemical equivalents as a true alloy. The solder can be used before the blow-pipe or with the soldering iron. In the former case, a little silver can be added to it without making it too hard to melt, and giving it a better color. For use with the copper bolt, this solder leaves little to be desired. The surfaces to be united are first scraped clean, and then tinned with the solder itself by rubbing it on hard with the bolt. The prepared edges are then soldered together with ease, using a hot iron and no flux of any description. This solder has been adopted for over two years by the Swiss Aluminum Company, the largest manufacturers of aluminum, and by the largest makers of aluminum goods in America.

While nothing terrestrial can be said to be so good that no better could be wished, yet, in view of the improvements in soldering aluminum made since 1890, it may reasonably be asserted that a satisfactory solution of the problem has been reached."

Method of Lining Rubber Plates with Aluminum.—Dr. Thos. R. Pixton gives his method in the *Items of Interest*, an abstract of which is as follows:

Take aluminum, 28 gauge, cut off a piece larger than the cast so as to have plenty of material to work on. First anneal the metal. Your cast must be hard and dry; if not quite dry enough put on your gas stove for half an hour. Place the aluminum on the cast and with your two thumbs press the metal down in the cast. Then commence to burnish it in shape. The best tool for this purpose is a bone tooth-brush, the handle of which comes to a nice rounded point and, with soap and water for a lubricant, in a few minutes you can burnish the whole palatal surface to shape. Anneal again. Hold the plate well in the cast and commence to burnish from the palate to the top of the ridge. Never forget that whether hammering or burnishing you must commence from the center and stretch the metal to the outer edge, otherwise you get folds that will be hard to get out. After having the plate well-burnished on the palate and ridge, hold the plate firmly with your fingers and commence folding over a little at a time and evenly all around to prevent folds. With a little practice and not losing your patience you can make a very close fitting plate equal to being swedged. Now prepare it for

adhesion to the rubber. This is done with a sharp enamel chisel. Hold it at an angle of about twenty-five degrees and make an incision thirty-second of an inch long, turning up the metal in the form of a hook. Do this all around the edges and over the palate. Then cut around in the opposite direction forming a double hook. These are small, but quite sufficient to hold the rubber. Now anneal the plate for the last time to make it soft, so that if it is not a perfect fit the pressure of the rubber while screwing the flask down will force the metal tight all around the cast, and make it a tight fit. Set your teeth up on wax, and proceed in the usual method, as in making a rubber plate.

Hinged Saddle.—Within the last four years I have placed in the mouth what I call a hinged saddle, and it works so nicely I will give a brief description of it.

In one case the patient had superior right second molar and cuspids; the left molars and bicuspid being out. I put in a bridge and on posterior side of cuspid crown soldered the one-half of a hinge, the other half I cemented with a tenant made of silver, which tenant I covered with a close fitting case of silver, all of which (tenant and case) was in shape of a truncated wedge. About the middle of this tenant and case I drilled a hole to admit a small pin to eventually pass through the rubber, which held the teeth to the gold plate saddle, and the wedge. After the bridge was fastened the truncated wedge which was united to the second half of the hinge, to the part of the hinge soldered to the cuspid crown; then placed the saddle on gum and with a little metal wax united the wedge and plate, pulled the hinge pin and removed so the pins could be more strongly united with wax preparatory for the impression.

I first made two wooden pins about three-quarters of an inch long—one to answer for a hinge pin, the other to pass through the wedge part—and when all was in place I took the impression in plaster, and when hard, pulled the hinge pin and removed. This was now ready for investing material, and when hard I cut away the impression plaster and prepared for soldering the tenant case to the saddle plate. Before soldering I pulled the wooden pin and slipped out the tenant and then invested, and soldered with 14 k. solder. When soldered, I cleaned and put back the tenant and pin, placed in the mouth as before and took a bite, then the impression for setting the teeth. A little cement was needed to close the openings to tenant case so the rubber would not fill it when vulcanizing. I let the first bicuspid press against the cuspid crown so that when the pin was in, the saddle rested snugly against the gum. The tenant pin with a head is to be drawn when the saddle needs to be removed for cleaning, etc.—*A. J. Stevens in Dental Digest.*

A Valuable Manner of Taking Impressions for Crown and Bridge-Work.—Dr. Theodore F. Chupein, in the *Dental Office and Lab.* says:

“Every one who has taken impressions with plaster of Paris for crown and bridge work, or indeed plaster of Paris impressions for any partial cases, where some of the natural teeth remain, have observed how the plaster will adhere to the necks of the teeth and is broken away when the impression is withdrawn. Many suggestions have been advanced to overcome this, such as mixing the plaster very thin, drying the teeth and painting the necks with glycerine, oil or soap solution before introducing the plaster in the tray, but, in our hands, without effect.

In an article which we recently offered to our readers, “The Construction of Crown and Bridge-Work,” published in the January 1895 issue, we stated that if pieces of orange wood were whittled to a double wedge, the breaking away of the thin septum of plaster between the teeth could be thus avoided. While this prevents the fracture at these points, it does not prevent the plaster from adhering at other parts of the teeth, so that the impression may not be termed absolutely perfect, at the parts which it is essential for it to be so.

We now offer another suggestion to this end. We use in our laboratory thin lead for taking the patterns of gold or silver plates, the shapes of clasps, etc. We do not mean by this the “Pattern metal” of the depots, but lead that we have rolled down for this purpose. We cast an ingot of lead in our ingot mould and have this rolled down to No. 30 gauge, which is thin enough yet stiff enough for all uses we make of it. Taking a piece of metal about one and a half inches long, and about the one-sixteenth of an inch wide (for some cases—wider for others) we bend it around the tooth, and with a pair of flat nose pliers we draw it snugly around the tooth, and with a burnisher fit it closely. The lead being inelastic keeps it thus close to the tooth, when we cut off the projecting ends. Leaving these bands on the teeth to which we desire to fit gold crowns on bands, we prepare our batter of plaster of Paris, put it in the impression tray and then convey it to the mouth with these lead bands in position. The extension of the bands engaging in the plaster bring the bands away in the impression, and when the die is made—for we use only our Crown Metal, for dies or models for bridge-work—the lead bands may be unwrapped or removed, leaving the tooth or root perfect, at the point where it is necessary to fit a gold band, crown, collar or face plate.

This manner of taking impressions for crown or bridge-work has another advantage. The gum at the neck of the tooth though so free as to permit an instrument to pass between it and the tooth or root, is yet

sufficiently tough and unyielding to prevent the soft plaster when it is introduced in the impression tray to take a perfect impression of the neck of the tooth, which is the part to which the band is to be intimately fitted. The lead band forces this loose or free gum away from the neck of the tooth, and permits a perfect free adaptation of a crown, band or collar. By this plan a perfectly fitting crown may be made *out of the mouth*, which is a great advantage.

If this suggestion be carried out by dentists who send their models to dental depots to have ready made crowns fitted to them, and would use our "Crown Metal"—instead of a plaster of Paris model—they would save themselves very much annoyance, for in doing this the clerks at the depots generally make the model fit the crown, instead of making the crown fit the model—owing to the readiness of the plaster breaking away from the plaster model, which is not the case when a "Crown Metal" die is used. The article in the January 1895 No., to which we have alluded, gives full instructions how these dies are made, which is done in less time than the making the same with plaster of Paris.

We would further add that when the tooth or root which is to be covered with a gold crown is wide or high above the gum, the lead band should be correspondingly wide, otherwise there will be difficulty of removing the lead band from the "Crown Metal" die."

Partial Artificial Dentures a Menace to the Natural Teeth.

—In an excellent article published in the *Dental Practitioner and Advertiser*, Dr. J. B. Willmott says:

"There are but few practitioners, of even limited experience, who have not observed the marked tendency to the development of caries on approximal and lingual surfaces of teeth in contact with artificial dentures, a tendency which has become more marked since the advent and almost universal adoption of plastic bases, hard vulcanite and celluloid.

"Every departure from the normal condition and relations of the teeth in the mouth that interferes to any extent with the free movement of what may be termed the interdental moisture is a menace to the permanence of the natural teeth, and a very important factor in the development of approximal surface caries. The degree to which partial artificial dentures thus endanger the remaining teeth will depend, of course, very much on the skill and intelligence with which the operation is performed. How are partial dentures on plastic bases usually constructed? Take, for illustration, the insertion of two lateral incisors on what is termed a band or spring plate, a very common form. An accurate impression is taken of the remaining teeth and associate parts, and the vulcanite base-plate of the denture is constructed so as to cover from two-thirds to four-fifths

of the palatal surfaces of the teeth as far back as the second molar. The denture fits beautifully into the interdental spaces; the artificial laterals completely fill the spaces and rest closely on the approximal surfaces of the cuspids and centrals, the base coming well up on the palatal surfaces of the teeth. The denture is put in position and pronounced a perfect fit. What have we accomplished besides replacing substitutes for two lost teeth? Simply this, that we have absolutely prevented any movement of the moisture in the interdental spaces so long as the denture is in position. In many cases these are removed but once in twenty-four hours, when the teeth are brushed on rising in the morning. As experiment has determined that starch and sugar lodged between the teeth are converted into acids in a very few hours, we can well understand why, in a few months the wearers of such dentures as I have described should be shocked to find that what they regarded as good cuspids, centrals, bicuspid, and molars had developed extensive caries. To the initiated there is no occasion for surprise. If this had been the result deliberately aimed at, no more certain means to that end could have been devised.

“While the class of partial dentures used as an illustration is possibly the worst sinner, inasmuch as in proportion to the number of teeth inserted it closes more interspaces and covers more palatal surfaces than other forms, the frequency with which lost bicuspid are replaced on dentures which cover the palatal surfaces of all the other upper teeth, preventing all movement of the fluids in the interspaces of the incisors and cuspids, accounts for the development of vast numbers of approximal cavities in the anterior teeth.

“Where crowns or bridges are inserted in such a manner as to impede or prevent the movement of the fluids over the approximal surfaces of adjoining teeth, similar results are produced. What is the remedy?

“Probably the best course to pursue would be to abandon entirely the use of plastic bases for partial dentures and substitute thin metallic bases, which will not close the dental interspaces or cover the palatal surfaces, at the same time exercising care that the tooth or teeth do not so closely fill the space as to prevent free wash over the exposed surfaces of the natural teeth, and depending for retention upon skillful clasping or on suction. With many patients the increased expense will make this method impossible. Even with plastic bases the evil may be enormously lessened. Where bicuspid or molars are replaced, what is known as a cut-off plate is an immense improvement on the ordinary forms.

Instead of reaching forward and resting on the palatal surfaces of the anterior teeth, it is cut from the cuspid on either side so as to expose in the median line from three-eighths to five-eighths of an inch of the mucous covering of the palatal surface of the mouth. Posteriorly it is

cut away from the remaining teeth so as to touch only a small portion of one tooth on either side of the space to be filled. It is extended across the palate and retained by suction. There are great advantages in this form in addition to the greater immunity from caries which it insures. At no place in the mouth is the denture so much in the way as immediately behind the anterior teeth. This form leaves this portion uncovered. The special sense of taste is located in the tongue, and this function is much more perfectly performed when the tip of the tongue can be brought into contact with the mucous membrane of the anterior part of the palate. This is permitted by this form of plate. In cases where, of necessity, the plate must pass across the palatal surface of some natural teeth, as where a molar, first bicuspid, and central incisor are to be inserted, the intervening natural teeth being in position, the edge of the plate should be chamfered down until quite thin, so that the smallest portion of the palatal surface may be covered and the interspace left free. The backing of the anterior teeth should be beveled away from the natural tooth so as to permit the free passage of fluids. In the insertion of Richmond crowns or Logan crowns care should be exercised that, especially at the central portion of the tooth, the artificial does not lie closely to the natural one."

DR. TAFT HONORED.

THE members of the Cincinnati Odontological Society assembled in special convention on April 30th, at the offices of Drs. H. A. & H. T. Smith for the purpose of honoring one of their number, who has been toiling for the relief of suffering humanity for more than half a century.

Dr. Jonathan Taft, who is widely and favorably known all over the country and we may say, the dental world, was presented with a beautiful bronze statue entitled "The Morning Star," by A. Gaudet. The statue is a female figure, three feet high, gracefully poised with one foot resting on a globe; the right hand aloft, holding a star.

Dr. H. A. Smith, in the presentation address, spoke of the great achievements accomplished by Dr. Taft, his wonderful ability in organizing societies and the high esteem in which he is held by *all* dentists. Dr. Taft not knowing the object of the meeting was taken entirely by surprise, and almost pathetically asked, "Why didn't somebody tell me?" In accepting the testimonial, Dr. Taft made a very happy response to Dr. Smith's

remarks. After which Drs. Cassidy, Leslie, Clancey, Hunter and others spoke at length of their high regard for Dr. Taft, and each one present had words of praise for him; some spoke as students, others as associates in dental meetings. The festivities of the evening concluded with an elaborate lunch served by the hosts.

A. C. M.

COMMENCEMENT UNIVERSITY OF BUFFALO, DENTAL DEPARTMENT.

THE third annual commencement exercises were held in connection with the departments of Medicine and Surgery at Music Hall, in the city of Buffalo, on Tuesday, April 30, 1895. After thorough examination by the Board of Curators, including the State Dental Examining Board, the Chancellor, upon the recommendation, conferred the degree of Doctor of Dental Surgery on thirty of the candidates for this degree. Whole number of matriculates at this session was 160.

OUR AFTERMATH.

MARRIED.—HILLMAN—WALKER.—On Wednesday evening, May 1st, 1895, Dr. M. G. Hillman and Miss Ina W. Walker were married at the residence of the bride's parents in Greenville, Mich.

MARRIED.—PECK—FARWELL.—At the Grace Protestant Episcopal Church, Sandusky, Ohio, on Tuesday, June 18th, 1895, Dr. Clarence D. Peck and Miss Jennie Farwell, both of Sandusky, were united in marriage.

We extend congratulations.

DIED.—The friends of Dr. G. F. Cheney, St. Johnsbury, Vt., will be pained to learn of the death of his estimable wife, which occurred on Monday, June 3rd. Mrs. Cheney had been an invalid for several years.

DIED.—DR. L. C. KELSEY, at his residence in Elyria, O., on June 6th, 1895. The cause of death was cystitis.

Dr. Kelsey was born at Whiting, Vt., on July 18th, 1824. In his seventeenth year he removed to Ohio and entered Oberlin College. He subsequently located at Mt. Vernon, where he studied dentistry, afterwards going to Galion, where he practiced for two years. In 1854 the doctor graduated from the Unitarian Theological School at Meadville, Pa., and for three years was the pastor of a church at Dixon, Ill. After faithful service in the war Dr. Kelsey settled in Elyria where he has since practiced dentistry. He was the oldest practitioner in the county and the first man here to make and give nitrous oxide gas. The doctor was a member of the Masonic order and was City Clerk, at Elyria, for 25 years.

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CONTRIBUTIONS.

CROWN WORK.*

BY DR. GEORGE EVANS, NEW YORK.

I WOULD say in explanation in not appearing before you with a regularly prepared paper, that I was invited by your committee to give a talk, or as I understood it, a demonstration, on something relating to crowns or bridge-work, that would interest you a little; and it was not until I received the announcement of the meeting of the Society that I know my name was down as an essayist. I have not had an opportunity to prepare a paper, for the reasons I have stated, in regular form, and will have to depend upon notes in the rough, to guide me during my talk, which will be: A Criticism of some forms of crowns for front teeth and an explanation of a method of crowning. I will preface my demonstration proper with a few remarks which to some may appear irrelevant, but, I think, are not so.

In presenting the subject of a tooth crown I am aware that dental science in the opinion of many members of a dental society should receive preference to that of art. But the usefulness of the profession depends on its art. Science is the guide, its aid. This statement, however, is not disqualifying to dentistry, respecting its acceptance as a profession.

* A talk before the Mississippi Valley Dental Society, April, 1895.

The editor and publishers are not responsible for the views of authors of papers published in the OHIO DENTAL JOURNAL, nor for any claims that may be made by them.

I so remark in consequence of some opinions that I heard expressed here yesterday at the session of this society. What is science, and what is art? I will endeavor briefly to explain. Nature is the presentation of the phenomena of the universe, including man himself. Science embraces the study, the investigation of these phenomena; art is the utilization of these phenomena of nature, and the reproduction of them. Science, to further its investigations, depends on art; art, on science to still broaden its field of usefulness. For advancement one is often entirely dependent on the other; for in science we use art, and art in science. Art embraces everything that is directly or indirectly the result of the work of the hands, including the creation of the sculptor, the painter, the architect, the physician and surgeon, the dental surgeon, and so on down to the humblest mechanic. The medical profession is constantly practicing art. What is the surgeon doing in the formation of a splint or appliance for his patient if it is not art? or in the construction of a plaster or a wood-fiber jacket, in cases of spinal curvature, on his plaster model of his patient if he is not practicing art, and indeed that which may be decidedly pronounced mechanical, so far as art is concerned? Dental art, consequently, should receive the same liberal consideration in the classification of dentistry under the head of a profession, or in placing it as a specialty of medicine. Anything that is at all novel in art, or that may be of interest in connection with dentistry, is therefore proper for presentation to a dental society. Now I have here drawn the form of a front tooth, a central incisor; (Fig. No. 1,) the presentation of that to you, the mere drawing, is art; but the consideration of that form analytically, is science. Now, that is simply a drawing of a central incisor; but there are some points about that, even, that some of the gentlemen here may not have considered. In that drawing we notice the apex of the root and the incisive edge of the tooth are almost on a direct line. Now, there seems to be nothing much, at a glance, suggested in that, to assist us. But there is considerable to guide us. In the first place every tooth crown that is inserted should have its incisive edge, as nature intended, directly on the line of the center of the root canal, and the apex of the root. Place it the least bit forward or inward and you throw it in an abnormal position.

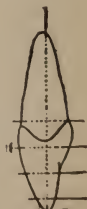


Fig. No. 1.

It is also a guide to us in drilling or reaming the root-canal in a front or incisor tooth and will prevent us from perforating the side of the root. All you have to do is to calculate where the incisive edge of the tooth was originally placed by the exposed end of the root and the position of the adjoining or approximal teeth's incisive edges and accordingly control the direction of your drill or reamer. I mention these points in connection with the method here illustrated regarding the crowning of a front tooth. The objectionable features of collar crowns are the exposure of the collar at the cervico-labial section, which is difficult to avoid, and the irritation its presence there is apt to cause the periodontal membrane, which it is more liable to do at this point than at the other sides of the root. The collar, to be invisible, has to be fitted well under the gum-margin. This requires extensive removal of the periphery of the cervico-labial section of the end of the root, rendering adaptation of the collar at this point an operation few practitioners succeed in accomplishing perfectly. The width of this section of the collar has also to be so reduced that it contributes but little strength to the crown.

As a matter of course, in bridge-work it is almost absolutely necessary in many cases that we should have the collar to entirely encircle the root of even a front tooth, but I tell you, frequently patients will not endure the exhibition of the gold above the porcelain at the cervix. It is often impossible to avoid this in many cases, if it is placed there at all. Many of these patients who object are ladies who have visited and lived in Europe, and have gotten European ideas instilled into them in regard to metal and they would rather have a plate inserted than a crown showing with the gold exposed above it. This is not so all over the country, but in many sections it is the case, at least with the society ladies of New York City; and I don't think it is even confined to New York City. Another thing we will consider, is, what is the use of a collar on that portion of an upper incisor tooth? I refer in my discussion here to-day almost entirely to the upper front teeth. I am not attempting to bring before you an exhibition of the crowning method in all its details. I wish now only to bring to your attention a few points, and I must necessarily be brief. We all know that in the normal occlusion of the front teeth that the force comes as exhibited. (Referring to illustrations on paper in view of audience.) All the resistance is required at

the palatal section of the root. The form of crown that I here illustrate is not new in principle, neither do I present it as a universal substitute for the ordinary collar crown, but as embodying features which are advantageous. The method I offer facilitates and simplifies the operation of construction so that it can be performed by those of only ordinary skill. In my intercourse with dentists I have had several prominent men in the profession privately candidly acknowledge to me that they never could quite, satisfactorily to themselves, fit a collar on a front incisor tooth; in fact, on many teeth. There is always something about it not quite satisfactory when the operation is completed. Now, this method embodies the principle of the collar crown and you don't have to make a collar. Many contend that if you have a tight accurately fitting post in the root and a close fitting cap on the end of the root, that don't want any collar at all that you obtain all the strength necessary without it. Dr. F. T. Van Woert, of Brooklyn, seldom, I understand, places a collar on the root of a front tooth; I have seen some very fine operations, and apparently durable ones come from his hands.

One trouble with the collar as ordinarily made is this: there is a section right here at the cervical-labial portion of the tooth that is very difficult for many to fit their collar accurately to. In trimming off that edge, as is illustrated in the form before you, there is a curve that requires considerable trimming and reduction to enable you to properly fit the collar, and when it is fitted, there is frequently an edge there that protrudes,

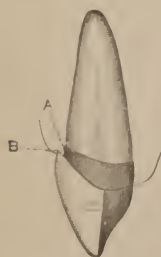


Fig. No. 2.

as shown in Fig. 2, at A, and when the crown and the porcelain is fitted to endeavor to bring it in line with the other teeth, you have to protrude that porcelain a little further front as illustrated at B. The cavity, or recess, at B is in many cases not filled in with metal unless in soldering you flow the solder around the cap and collar into the recess. In many cases I have examined where recession of the gum has taken place, it was due to that little recess more than to the collar. Now take a superior incisor as here illustrated. Fig. 3 shows laterally the form given the end of the root. The end of the root is trimmed at the approximal sides and sufficiently here at the palatal side (B, Fig. 4) to bring it on a line with the gum; the cervico-labial margin A is left intact. In

trimming I use these trimmers such as I will show you, as they may not before have been brought to your attention. Since they have been introduced I

have tried many other forms that have been presented, and after all I have never found anything—and many gentlemen have endorsed that opinion to me—equal or superior to them

for trimming the sides of an incisor root. By placing the trimmer in a dental engine, and resting the

thumb on the incisive edge of the adjoining tooth you can trim off the sides of the root most easily. I also use in trimming the sides, an instrument like this, which aids me very much. (Shows a double-ended scraper.) You will pardon me for introducing these instruments in the way I do. There are a good many questions asked me by gentlemen, how I do this, and how I do that. After the shaping is done in the manner indicated, also aided by disks and corundum points, the root-canal is enlarged with an Ottolengui root-canal reamer (Fig. 5,) which takes only a



Fig. No. 5.

moment. The size and condition of the root and the judgment of the operator should determine the number or size of the reamer to be used and the depth to which the canal should be reamed. I usually commence with No. 1, the smallest size, and then increase. I generally use No. 1 for a lateral, 1 or 2 for a central, and 2 or 3 for a cuspid. To the reamed canal is fitted a prepared iridio-platinum post, as illustrated here in Fig. 6, corresponding in size to the reamer used. By reaming the tooth-canal and then introducing a post exactly the size, you instantly obtain a tight fitting post.



Fig. No. 6.



Fig. 7.

Next, take this prepared platinum disk, having a perforated concave depression as is shown in Figs. 7 and 8.

The disk of platinum is about No. 35 gauge. In the depression of the disk, pure gold has been melted. The post, when fitted to the canal, is grasped at the line of the orifice of the canal with small pliers, about here, as you see, in that manner (illustrating). That gives about the line of the distance the post goes into the root canal and therefore it should go into the disk.

By twisting the post in the disk change of position is in-



Fig. 3.

stantly effected. Sometimes when adjusted on root and nearly in position I give the post a press upwards, which brings the edges of the platinum of the disk down into the orifice of the canal, and the serrations on the post enable the post to hold the platinum in position. With this object in view I slightly enlarge the orifice of the canal with a round-headed bur. Both post and disk (Fig. 9) are next removed, and the post soldered in position to the disk by being held in a Bunsen flame, and heated to a point that fuses the pure gold in the depression around the post. No flux is necessary, as sufficient remains from the first fusing of the gold. The post with the disk is next inserted in the root, the platinum pressed with a large flat plugger, and malleted so that the line of the edge of the end of the root will be impressed upon it. The platinum is next removed, and slit at the two points between the palatal and approximal sides, as shown at A and B, Fig. 10. The line of the end of the root is supposed to



Fig. 9.



Fig. 10.

be represented here on the disk by the process I have just explained. Guided by the mark of the end of the root on the platinum, the approximal portions of the disk are bent over with small-pointed pliers to embrace the sides of the root. The post and cap are then placed on the root and the side flaps, with the aid of foot-shaped condensers and burnishers, are closely fitted. The palatal flap is next brought down to position. Frequent removals and annealings are necessary during the process, which finally should include trimming the edge of the platinum, smoothing with a corundum point, and then an annealing and an all-around burnishing of the cap to the root. At the cervico-labial section the porcelain can rest on the platinum, or the platinum can be trimmed so that the front edge of the porcelain may be fitted against the root and cover it, as illustrated here, in Fig. 11. The projecting end of the post should next be removed, leaving it a little flush at the palatal side. The porcelain front, which should be a cross-pin plate tooth, is ground and closely fitted to the surface of the root or metal, as may be, at the cervico-labial section under the edge of the gum, but a slight space opening toward the palatal side should be left between it and the surface of the cap.

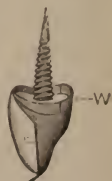


Fig. 11.

To so shape the porcelain simplifies the fitting of the cervical

section. The space between the cap and the porcelain is also easier filled in the soldering. To the base of the porcelain front B, Fig. 12, a piece of very thin platinum foil is shaped, the porcelain heated, the part veneered with a mere film of gum shellac or resin and wax, and by pressure with a napkin or cotton the platinum foil is attached thereto. The rest of the porcelain is then backed with thin platinum plate (about No. 35 gauge). The platinum is left slightly extending over the incisor edge (Fig. 12). The porcelain front is next waxed in position on the cap. Fig. 11 shows the crown waxed up ready for investment. Wax in full amount must be extended over the collar to its edge (W), in the seams, and between the porcelain and the cap at every point solder is to flow. I generally use Parr's fluxed wax. In trimming the investment the material must not be removed from over the collar lower than the line of the surface of the cap, or in such a manner that the platinum turn-over edges are exposed to the direct force of the flame (Fig. 13). Even though the collar is not exposed, the solder will flow over the outer surface of the platinum just where wax has been applied and the solder is wanted, and all the parts will become united.



Fig. 12.

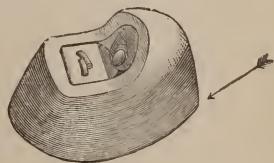


Fig. 13.

The investment must be slightly raised at one end, and headed up at its base with the full flame of a gas blow-pipe thrown in the direction indicated by arrow in the drawing. Heat thus applied will cause the solder to flow downward and fill the interstices in all parts of the investment as though it were an ingot. The best way is to apply a little solder at a time until the deeper parts are filled. The flame is then withdrawn for an instant, and with a small pointed flame and more solder the backing can be contoured. As platinum forms the cap and backing, the soldering can be conducted without fear of accidentally fusing those parts.

I wish to explain a point with regard to the cementation of crowns; this kind of crown, or any kind of a collar crown. Having the root and crown ready I warm the crown, and apply a thin coating of chloro-gutta-percha to the post. The chloroform, instantly evaporating, leaves a film of heated gutta-percha. Immediately the crown is adjusted to the root and removed. This

shapes the gutta-percha on the post. The crown is then allowed to cool, and is cemented on as though no gutta-percha was used on post. A crown so cemented can be removed at any time by repeated applications of the thick part of a heated root-canal drier to the metallic portion of the crown, which communicates the heat to the post. In a short time the sheath of gutta-percha around the post is softened, and the crown can usually be removed without difficulty. I also attach ordinary bridge-work in this way, having abandoned the use of methods classed as "detachable," which only allow the bridge to be removed by the dentist. (Dr. Evans here passed among the audience a tooth which he had crowned in the manner described and has since extracted, which exhibited a sample of his work that was made without any idea that it would ever be exhibited.)

The question may be asked, as it was asked of me once by a gentleman, when I was describing this method, does that pin enveloped with a film of gutta-percha in that way, hold in? You all know you can cement on a crown very firm, if you have a nice fitting post, with a little film of gutta-percha alone. Here is an ordinary root that has been capped in the usual way and the post alone is secured with gutta-percha, and nothing put in the cap; I will let you just try that and see if either of you, gentlemen, can move it. I question if I could move it with the pliers without I heated it. In that way I have found perfect satisfaction and security.

One other thing I would like to bring to your attention, which I have had remarkable success in,—and that is in making hollow all-gold dummies. A great many gentlemen have told me that they preferred to use them on the lower jaw where they are not seen. We all know that in making gold dummies with a porcelain front they fill them in at the labial side with gold, which makes them very heavy. Where they make them entirely of gold, like the dummies shown to you in the past by Dr. Knapp, of New Orleans, you remember there was great weight attached to them. My method is to form these dummies hollow. I prefer a seamless crown that is stamped out of one piece of gold. You can do it with one of those crowns you can purchase, or with a crown such as is made with one of the machines now used by many. The crown is shaped and fitted to the model as a dummy, either with self-cleansing space or to rest on the membranes, in the

form the bridge was constructed yesterday and shown by Dr. Callahan. You can then remove the crown, and fill in the grinding surface with gold solder or gold plate—the crowns that I use are alloyed with platinum—you can melt gold-plate right into them without fear of melting the crown. I then boil them out in acid. I never solder a crown *on the outside* till I *remove the flux from the inside*; that is a little point to remember. To enclose the aperture at the neck I adapt over it a piece of platinum plate about 28 gauge, and put a piece of solder inside in the center and heat the crown up to the melting point of the solder. When the solder melts it flows down and runs along the plate, and the moment it strikes the edges it firmly unites them.



Fig. 14.

Fig. 14 illustrates the process; Fig. 15, a bridge and hollow dummies. The point has been brought up, "Is it hermetically sealed up? Does it leak?" To an educated man I should think it is not necessary for me to say it is hermetically sealed up, because we all know when you heat to a certain point, a red heat, you almost entirely exhaust the air. When you heat it to a dull red heat your solder melts, then you heat it up a little further and the solder flows over to those edges. As the crown cools, as a matter of course the solder cools, and the entrance is instantly stopped and hermetically sealed up—just as a housewife, as you all know, takes a jar of preserves and at boiling point seals down the top.



Fig. 15.

This illustration, pointing to one before audience, refers to the form to give the grinding surface of dummies in bridge-work. I see it in many men's work, and I practice it in my own work. It is all right to restore the labial form of the teeth; but I prefer to favor the grinding or occluding surface of a dummy from the palatal to the labial side. Consequently I always reduce the dimensions of it slightly, about in proportion as you see there. That is the normal average side of the tooth (illustrating) and that would be the proportional size, as a rule, I would form my dummy. There is something else in this. It lessens the curve of the self-cleansing surface. It is very desirable not to have too much inward curve. If that was a short tooth it is very apparent that an immense slot would be formed by making the dummy as wide in proportion as the natural tooth. I will

pass around some specimens I have here. There is a bridge I formed for the American Dental Association last summer, shown in Fig. 15. I was not over a couple of hours making that bridge. As a matter of course I could not do work intended for the mouth of a patient in that time.

In making my explanations you will pardon me if I have presented any material such as I have presented at the American Dental Association's meeting. I have not before presented it in detail as I have here. My explanation there was anything but clearly understood by a number of the gentlemen present.

SOME PRELIMINARY REMARKS

ON THE TRI-STATE DENTAL MEETING JUST HELD.

THE recent meeting held in Detroit, June 18, 19, 20, was, with one or two exceptions, the largest ever held in America. Fully five hundred dentists were in attendance and an undivided interest was manifested to the last. The essays and clinics were of special value and everyone felt many times paid for going. It proved conclusively that general sessions are much more satisfactory, even to so large a gathering, than section work.

Aside from the benefits of the sessions, the social features deserve special mention, particularly the boat-ride to St. Clair Flats, given by the members of the Michigan Dental Society, and the bountiful supper at the Club House, which no one missed.

Prominent men from other states were present, and assisted materially in making the meeting a grand success. Illinois was well represented by a large delegation of prominent Chicago dentists, while Missouri, New York and Pennsylvania, although not sending so many in numbers, were represented by men who are a power in themselves. The "grandest meeting ever held!" was the exclamation of many; it was a surprise even to the men in the front ranks of society work and the dental profession. Great credit is due the Executive Committee and others for their unceasing efforts to make it second to none.

Of those who were instrumental in making it a grand success, we may mention:



L. L. BARBER.

Dr. L. L. Barber, Toledo, O., who, at a meeting of the Ohio State Dental Society in 1893 suggested that a Tri State meeting be held. Dr. J. Taft moved that a committee of three be appointed to confer with a like committee from the Michigan and Indiana Dental Societies regarding the advisability of holding such a meeting. Pursuant to a call these representatives met at Old Point Comfort during the session of the American Dental Association in Aug., 1894, and decided upon holding the meeting in Detroit in June, 1895.

Dr. J. Taft was chosen Chairman of the three committees as a whole. The Executive Committee chosen was Dr. L. L. Barber, Toledo, chairman, Dr. Geo. E. Hunt, Indianapolis, secretary, and Dr. J. Ward House, Grand Rapids. Dr. Geo. L. Field, Detroit, was chosen chairman of the committee of arrangements.

Few have any idea of the immense amount of work involved in getting everything in shape for such a gathering. The Committee at once set to work in earnest, determined to make the meeting a success, and they did.



J. TAFT.

Everything had to be done by correspondence, and few who have not tried this method of conducting business realize how unsatisfactory it is, or how much time and work it requires. Dr. Barber declared that the letters he had received regarding the Tri-State meeting, if piled together, would be a foot thick. Dr. House declared that his stack was not an inch short of one and a half feet thick. Dr. Hunt, as secretary, stated that his pile was at least a yard thick and a foot wide. Dr. Field, not to be outdone, took a survey and found that he had not only a full yard but a full house.



J. WARD HOUSE.

These *facts* are given for the benefit of those in other states who intend to go and do likewise.



GEO. E. HUNT.

The entertainment for the dentists was complete, and for this Dr. Field deserves great credit. He was ably assisted by Drs. Jos. Lathrop and A. W. Diack. In appreciation of his personal efforts a beautiful mirror and standard was presented to Dr. Field by members present. Dr. W. C. Barrett, Buffalo, made the presentation speech and it was a masterly effort. Dr. Field was taken completely by surprise, so quietly had the affair been conducted. It was a memento well bestowed, for no one is

capable of appreciating such a gift more than Dr. Geo. L. Field.

Dr. W. C. Barrett, Buffalo, did much toward the success of the meeting. Aside from entering enthusiastically into discussions, he favored the Society with an excellent lecture on Bacteriological Pathology, with lantern illustrations. The photo micrographs presented were from Prof. W. D. Miller's personal collection and were very fine. Another gentleman present who entered enthusiastically into the discussions of essays was Dr. H. J. McKellops, St. Louis. Perhaps you know him; almost everyone does. When he has anything to say in meeting (dental meeting), he does not hesitate to say it, and usually with such effect that he carries the majority with him.



GEO. L. FIELD.



W. C. BARRETT.

Then there was Dr. C. S. Case, Chicago, who presented a paper on the Development of Facial Contours in Dental Orthopedia. Nothing but the highest praise could be said of this paper and the facial casts of cases cited. Dr. Case is doing a marvellous work in this direction, far ahead of anything previously attempted. In operating for the correction of irregular teeth he not only moves the teeth themselves to line, but, by means of a special appliance of his own device, successfully carries the alveolar process, together with the teeth, for

ward or backward, with the result that facial contour is restored with the correction of the irregularity.



H. J. MCKELLOPS.

to tell the precise degree of heat when fusing; this difficulty is also overcome in the electric oven. There are two sight openings arranged at such angles that a ray of light entering at one opening is reflected out through the other. By this arrangement the surface of the plate is clearly seen, and the different degrees of fusion are readily distinguished, even by the inexperienced. The electric oven produces such a high heat, at so small a cost, that these openings may be left open during the entire fusing process, and closed only for tempering the case. It is difficult for the older practitioners, who are accustomed to coke, gas and oil, to fully grasp the simplicity of the new operation. It is too great a step toward the ideal we have



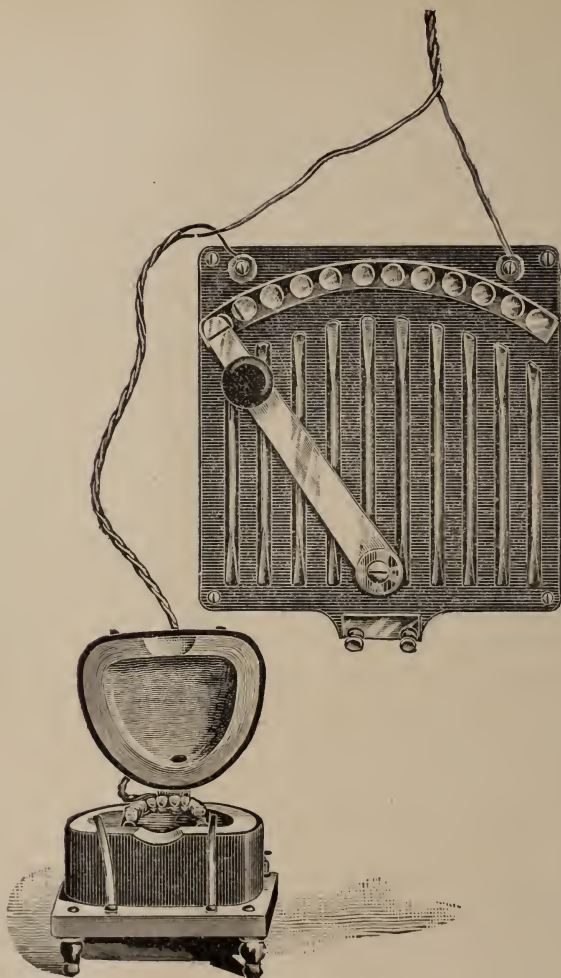
C. S. CASE.



L. E. CUSTER.

long sought in continuous gum work, to be realized at once. The case is put in position and covered with a lid, and the whole fusing process watched from a distance of but a few inches. The heat is perfectly controlled by the touch of a button and the case allowed to cool without removing it from its place. That our readers may get a more adequate idea of this ideal furnace we here insert an engraving of it.

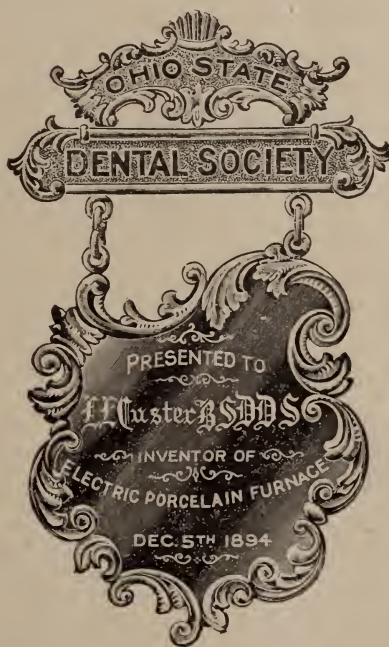
It was on account of this and other valuable inventions and suggestions that the Ohio State Dental Society at its last meeting voted to present Dr. Custer a gold medal in appreciation of what he had done for the



dental profession. At the Tri-State meeting the medal was presented to Dr. Custer. When returning on the steamer from the excursion to St. Clair Flats, Dr. Otto Arnold, Columbus, chairman of the committee on Custer medal, arose and said:

“Ladies and Gentlemen and Friends:—Give me your attention for a few moments and I'll endeavor to complete some unfinished business begun at the last annual meeting of the Ohio State Dental Society, held in Columbus last December. Among many good men in that organization, there is one whom we particularly delight to honor at this time, principally on account of

his unselfish devotion to the interests of the dental profession. Many of you may not know him, for he is still a youth. But most of you have heard of him or his achievements, and will know more of him later on. He hasn't, as yet, set the rivers on fire, but he's making some things red hot. I refer to Dr. Custer, inventor of the electric furnace. Briefly, then, at the aforesaid meeting of the Ohio State Dental Society, in acknowledgment of his usefulness, a resolution was unanimously passed which provided for the purchase of a suitable testimonial to be presented to Dr. Custer. The testimonial has been secured, and in behalf of the Ohio State Dental Society, I take this opportunity of presenting Dr. Custer with this beautiful medal."



TRI-STATE DENTAL MEETING.

THE dental societies of Indiana, Ohio and Michigan met in joint session at the Detroit College of Medicine, Detroit, Mich., June 18, 19, 20, 1895. An address of welcome was given by T. A. McGraw, M.D., President of the College. Response on behalf of Indiana Society was made by Dr. S. E. Harryman, on

behalf of Ohio by Dr. W. H. Todd, on behalf of Michigan by Dr. Geo. L. Field. The regular session then opened and essays and discussions followed.

The first paper to be presented was

THE DENTIST IN HIS PROFESSION, AND AMONG THE PEOPLE,

read by DR. S. B. HARTMAN, Ft. Wayne, Ind.

He said: "The first thought as to what relation a dentist sustains to his country and profession, is his first step as a student of our noble calling, and very often if a boy can make a good kite, or his grandfather was a manufacturer of wheelbarrows, or if the boy could make a good joint with two boards in a carpenter shop, his future life should be that of a dentist. While mechanical skill is of great importance, and I would not in any way deprecate the same, yet if our profession wishes to occupy a position on a high plan, and to stand side by side with those professions whose society it strives to associate with, it must of necessity form its young and coming members, not only of those with an inclination to mechanics, but of those that combine these attainments with a knowledge of scientific and physical laws and a general understanding of those studies, that will tend to an education that will admit the student to the society of the learned professions. I rejoice that many of our colleges are making the examination for admission of a high standard, more I think after having given the question much thought from all standpoints, that the better the general education of the student, the better will be the dental practitioner, not only as a dentist but as a citizen. In addition to the student possessing an education, I would make morality a consideration of his admittance to our profession, for if in any profession or calling it should be insisted upon, it is that of dentistry.

Coming in contact often with those of sensitive nature, how important for his welfare and the community in which he lives, that his character be above reproach, hence I may say the character is paramount, in the admittance of a student.

Regarding the practitioner, his idea of what will advance his practice will cause him to be recommended in the community, his ability not only in the mechanical line, but his position as a citizen. It is of great importance that he possesses an education outside of his chosen profession, that he may be not only admit-

ted but sought after, to mingle among the best of society of the place where he may reside.

Not long since, a dentist of great ability and an advocate of a higher standard for his profession, and whose life work has been in this direction, remarked that it was greatly to be regretted that in our profession we had so few men of attainments beyond that required in the care of teeth. While to some extent this is too true, yet I am happy to say that there are many who are taking advanced standing and are endeavoring to raise dentistry into that sphere it should occupy.

Dental associations have much to accomplish to broaden one in thought; the mingling of persons of like interest, incites a zeal to advance. Local societies have salutary influence on each member, and I would suggest that not only questions pertaining to dentistry be considered at its meetings, but great good could be obtained if at each alternate meeting questions not pertaining to their profession be considered, but that history, biography, current events, and similar subjects be the topics for papers and discussions; thus would be presented a field for thought and research.

We all have a peculiar influence on others; we may feel that in our little personality no one is changed, but we are little aware how each day some one is elevated or depressed.

In our profession we need not be circumscribed, and need not and should not live entirely within the four walls of our office. Not only dental journals should be found in the office of a dentist, but the leading magazines of the day. Far better a dentist should have one dental journal and two literary magazines, than two dental journals and no literary journal or magazine.

How can the attendance of our association be increased? This question is often asked. In my opinion the small attendance is not caused entirely from outside causes. Dentists not members desire its privileges and enjoyments, but through the fear of becoming a member, certain restrictions will conflict with their preconceived ideas of conducting their practice. In one of the states represented here to-day, are five hundred dentists, and the entire membership of its state association is only about eighty, and an attendance of fifty members would be considered large. The four hundred and twenty dentists not members are largely composed of men from the same schools as the association mem-

bers, and during college life stood side by side, passed the same professors, and have good standing in society.

What is needed is a great out-reach to those out of our association, and it may be that some of those minor regulations of its management should be changed; let it be done. Dental colleges graduate students as worthy, why do not the associations receive them? The question has come to this, that the colleges are graduating men whose manner of practice is not in accordance with dental ethics, or the associations are at fault. When the time comes that this important question can be adjusted, and that talent and ability can be comingled, and each to himself derive a personal benefit from them, then will good-will, and a citizen worthy of respect from his fellow practitioner and the admiration of those in whose midst he lives, be the result.

A paper was then read entitled :

ALVEOLAR DENTAL HEMORRHAGES,

By Otto Arnold D.D.S., Columbus, O., of which we present an abstract.

He said: The exciting cause of hemorrhages under consideration must necessarily and, primarily be traumatic. The trauma may, however, be simple or complex, viz.: a simple bony socket with its connective tissue unbroken, scarcely disturbing the capillaries sufficiently to excite a flow of blood, or there may be more or less laceration of the tissues with fracture of its socket walls or deeper part of its maxilla, involving larger vessels, complications that materially influence the degree of hemorrhage in the most ordinary, or if you please, normal conditions of the system.

In addition to the trauma, there may exist a predisposing cause, viz: the condition known as the hemorrhagic diathesis, classified by some authors as a disease of the blood, technically termed hæmophilia; more commonly the patient being designated by the term "bleeder."

The majority of cases of hæmophilia are traceable to heredity, although it may originate spontaneously. It is more common in males than females, the proportion being about 12 to 1. Structural weakness in the vessels, and deficiency in the coagulating element in the blood—are the conditions that seem to account most plainly for this disease.

In the statistics by Townsend, of fatal cases of hemorrhage

from various trivial surgical operations, tooth extraction is given as the cause of the greatest number. This may seem to many a startling statement; but it has never been successfully contradicted and it should be a standing menace to the dentist; warning him against carelessness in his operations and narrowness in his professional attainments.

Among the local agents in persistent bleeding from external surfaces, Monsell's salt, or persulphate of iron, has been much lauded. I have pleasure in the opportunity to condemn it as the most unreliable, treacherous agent to be used for the purposes under consideration. The clot that is formed by the aid of this agent, is quickly formed, but too frail in structure to withstand the *vis a tergo* of the blood current, usually, it soon breaks away and secondary bleeding follows.

Forcibly plugging the bleeding socket with wood, cotton, wax, etc., for the purpose of mechanically stopping the flow of blood, is too violent a procedure, often doing more harm by expanding or distending the socket and its environment thereby increasing the provocation. In fact I am opposed to the application of force in any form.

The only satisfactory results have been attained by the simplest remedies applied in the gentlest manner.

As an astringent for local use, tannic acid, either in powder or saturated aqueous solution, for direct application to the bleeding parts, is the most efficient and safest of all agents known to the writer, and will not fail to accomplish its purpose in ordinary cases, uncomplicated with constitutional tendencies or injury to the larger vessels.

A simple method of application, is to introduce a quantity of dry tannin into the bleeding socket and follow with a pledget of dry cotton, gently placed but filling the cavity snugly; the subsequent expansion of the cotton as it becomes moist securing its retention.

If arterial hemorrhage exists, and torsion or ligation is impracticable, I would recommend the application of a batter of plaster of Paris, enveloping the parts as in the process of taking an impression, the hardened mass to be left *in situ* until all chance of a recurrence of the bleeding has passed away. To allay mental excitement and diminish the frequency of the pulse beats, drachm doses of the fluid ext. of ergot may be given at intervals of three hours.

Since positive or pathognomonic signs may be entirely absent in constitutional bleeders, it is not possible to be always forewarned, and not until the patient for whom we may have extracted one or two teeth may become alarmed at a prolonged and persistent hemorrhage, is the case understood.

If, however, we have knowledge, or suspect the existence of the hemorrhagic diathesis in a patient, every possible protective measure should be brought to bear upon the case to prevent, as far as possible alarming or dangerous consequences. My universal method of procedure in the management of patients following tooth extraction, is to have them rinse the mouth freely with hot water. This encourages free and uninterrupted bleeding from the wound, and stimulates a normal reaction in the tissues, soon followed by a natural cessation of the hemorrhage.

If any considerable amount of laceration has taken place, I attempt to replace the tissues by compressing with the fingers or stitching into apposition any pendant portion of the gum, prescribing as a dressing:

R Tannic acid, gr. xx,
 Listerine,
 Aqua Dist. a a ℥ iv.

M. Sig. Apply frequently to the wound.

If the patient is known to be a bleeder, or in the absence of any evidence to that effect, if the bleeding be prolonged indefinitely, I should at the first opportunity prescribe gallic acid, in ten grain doses to be taken into the stomach every hour until bleeding is arrested. A well tried prescription is the following:

R Gallic acid ℥ i
 Aqua cinnamon ℥ iii

M. Sig.—Tablespoonful every hour until hemorrhage ceases.

Gallic acid as an internal astringent, possesses superior properties and is free from the disadvantages of inducing constipation.

Gallic acid, in addition to being an astringent, has the property, I am convinced, of increasing the coagulable properties in the blood, having observed the greater facility with which a clot is formed after the agent is administered.

I have never seen a case of alveolar dental hemorrhage that was not arrested after the taking of from one to three ten grain doses of gallic acid. I consider it the most valuable agent known for the purpose in question.

In conclusion then—independent of surgical or medicinal means which might suggest themselves in given cases, I rely upon two agents, viz: gallic and tannic acid. The former for systemic, the latter for local effects.

But after all, and above all, would emphasize that old saying that “an ounce of prevention is worth a pound of cure.”

DISCUSSION.

DR. BROPHY (Chicago) recommended *hot* water as a good hemostatic. He said ergot had its advantages, and so did gallic acid; but tannic acid was no better than sub-sulphate of iron; not the perchlorid, for that would form an eschar and damage the tissues.

Men who drink to excess are liable to greater hemorrhage after an operation. This is probably due to the action of the alcohol on the fibrin of the blood.

He said he would not place the patient in a recumbent position, as suggested in the paper, in cases of hemorrhage of the mouth. On account of gravity, the upright position was best.

Sometimes a gutta-percha plug, dipped in sub sulphate of iron and tied in the tooth socket, or pressure brought to bear on it by closure of the jaws, is valuable in arresting hemorrhage from tooth extraction.

DR. BUTLER (Cleveland) said that although the subject might seem simple, it was a very important one, because the subject of tooth extraction forces itself upon us daily. He was surprised to learn that Dr. Arnold condemned the bandage or pressure as a means of arresting alveolar hemorrhage.

DR. TEMPLETON (Pittsburg) said a valuable means of diagnosis was to watch and see if the blood flowing from the tooth socket was arterial. If so, it was best to keep the patient in the office for some time and watch the indications. Tannic and gallic acid can be relied upon.

DR. JACKSON (Ann Arbor) cited a case of severe hemorrhage following tooth extraction, where all of the usual means failed. He found relief from heating the feet in *hot* water. When the flow of blood is toward the head, the hemorrhage is liable to recur; the hot water foot bath draws the blood from the head. Acetic acid, one or two drachms of vinegar, he said, would often successfully check hemorrhage.

DR. H. A. SMITH (Cincinnati) said that what we do in the way of treatment, we should do thoroughly. It was his opinion that there is less hemorrhage when the physical powers are rested, and it was desirable to have patients present in a rested condition.

DR. ARNOLD (Columbus) said he was opposed to bandaging, because it was unscientific.

A paper entitled

HABIT SPASMS,

was read by Dr. E. T. Loeffler, Saginaw, Mich. An abstract follows:

"Habit Spasm" really belongs to a class of diseases in which there are no constant changes to be seen with the naked eye. It was formerly the custom to include them all under the term "functional diseases," but microscopical changes have been discovered in some of them with sufficient frequency to make it certain that there is far more than a mere disturbance of function, and it cannot be doubted that most of these maladies depend upon alterations in the nutrition of the nerve elements, although these may not yet have been found, and perhaps cannot be detected without more means of investigation than we at present possess.

Children often, and adults sometimes, present spasmodic movements, such as winking, twitching the mouth, jerking the head, movements that have a half-voluntary aspect, but which the individuals are unable to control. The patient is said to have "got a trick" of moving the part. Weir Mitchell calls this "habit chorea," but "habit spasm" is perhaps the better term.

The condition is met with chiefly in childhood, especially in the second half, but it sometimes commences in youth, and even in adult life. In young women it is often associated with symptoms of hysteria and there may be a difficulty in deciding whether certain spasmodic movements are to be regarded as of reflex dental neurosis, of habit spasm or of hysterical spasm.

When it commences in childhood, the affection commonly ceases after a few months or a year, but it occasionally goes on to middle life or even longer. Rarely it begins late in life and is then generally permanent. In early life it occurs especially in nervous and excitable children. The affection is said to be more common in females than in males, but is very often seen in boys.

Some writers claim that impairment of general health often precedes the development of the movements; occasionally they appear to be due to some special influence depressing the nervous system, over-work at school, a fright or some injury. In one case, for instance, the onset followed a fall into water.

Again we notice that frequently there is a history of other neurosis in parents or other relatives. It is quite probable that the affection often arises by imitation; not direct imitation, perhaps, but the witnessing of such movements is apt to produce a peculiar excitability, which finds expression and relief in movements of a similar nature. In cases in which something like direct inheritance can be traced, it is probable that this influence has been at work. A father, for instance, had such movements in the face all through his life, and two children likewise presented them. So we must frankly admit that in many cases no causes can be traced, and the affection seems to be the result of the restlessness of childhood, specialized, as it were, in a particular direction. In one instance a relative of mine, a girl, who began to blink the eyes in early childhood, still did so at the age of thirty.

In another case that was reported to me, a clergyman of thirty-seven was greatly annoyed by an involuntary smile, of somewhat meaningless aspect, which would cross his face from time to time without the slightest corresponding emotion, and even when he was engaged in public in the most solemn parts of the church service. It never troubled him when he was preaching or in conversation, but it often occurred when he was looking at another person and sometimes gave rise to misconception. It commenced at the age of sixteen and was at first more than a smile, being actual laughter, but it gradually subsided into its present form.

The following are two important cases which have been under my personal inspection and treatment for some time. The first, a Mr. E. Short, of Saginaw, W. S., age about seventy. The trouble came on about six years ago while living in Texas. It began by a slight twitching of the muscles under the right eye. There was no pain at any time. One year from the time it started he consulted a dentist who extracted the right upper cuspid, but this gave him no relief. At the present time all the upper teeth are wanting, but the trouble still exists, being periodical in its nature, and the right eye partly closed.

The second case was that of a lady aged about forty. Her trouble came on about four years ago and in very much the same manner as that of the previous case mentioned. She has a twitching of the left masseter muscle at intervals, and also of the lower eyelid of the corresponding side. This trouble has been a source of a great deal of annoyance to her, so much so that she consulted a number of physicians with the hope of getting relief. She was finally induced to have her teeth examined. I extracted all the diseased teeth that she had in her mouth some time ago and instructed her to report to me in case she received any benefit therefrom; but I have thus far been unable to get any word from her.

There are many well marked cases on record in which the cause of this muscular disturbance of the face was found to be due to an irritation reflected from diseased teeth.

The subject is of the profoundest interest and importance but is little understood even by our best investigators. One fact, however, seems to be apparent, and that is that there is some abnormal relation between efferent and afferent nerve impulses. The trigeminal nerve is undoubtedly the most remarkable nerve in the whole nervous system, especially when we consider the intricate connection of its nuclei with those of the various motor cranial nerves.

This will undoubtedly afford ample explanation for the great many reflex disturbances that arise from one cause or another. But why this irritation due to pathological conditions of the teeth, for example, should in one case result in a wry neck or facial spasm, and in another in blindness, in deafness, in chorea, in dyspepsia, in epilepsy or in mania, is an inquiry at present unanswerable and almost beyond our comprehension.

From what I have read on this subject, together with my own personal observation, I have come to the conclusion that cases of this nature receive altogether too little attention from the dentist as well as from the general practitioner.

In as much as "habit spasms," or whatever muscular disturbance it may be, are generally increased by observation, it is very important that little notice should be taken of them by the friends of the patient. Sometimes the movements will then cease without further treatment.

They are seldom under direct voluntary control, and the

endeavor to prevent their occurrence may be futile, especially if the attempt is made under the fear of threat and punishment. But the promise of a reward at the close of each day on which the spasm has not occurred will sometimes gradually cause their disappearance; a strong desire free from any depressing emotion effects that which the will cannot directly achieve. Any obvious defect in the health must be made good, and a change of air is often very beneficial, especially when a change in companionship can be secured at the same time. The deterring influence of strangers is often very marked. Of drugs, arsenic has certainly most influence. Weir Mitchell has known the hypodermic injection of arsenic to succeed, when other things failed. Nerve tonics, such as quinine and strychnine, may with advantage be added. If there is much excitability of the brain, or if spasmodic movements are seen, bromide of potassium may be needed, and occasionally a local blister is very efficient. The smiling clergyman mentioned above ceased to be troubled after he had for a few weeks taken some arsenic and iodide of iron, and a dose of bromide each time he had to conduct a service in church.

In recent cases of facial spasm, apparently excited by cold, free diaphoresis should be employed, and the face and side of the head bathed frequently with hot water. If there are indications of organic disease, the nature of this must be ascertained, and, as far as possible, treated. All causes of reflex irritation must be sought for and removed; decayed teeth should be extracted, especially if they are on the same side as the spasm. Occasionally such nervine tonics and stimulants as zinc, nitrate of silver, asafoetida and valerian may be given, but in the vast majority of cases they conspicuously fail. Sedatives applied to the skin seldom exert any influence over the spasm. Hypodermic injections of strychnia or of morphia have done good in some cases. In the use of morphia for the relief of spasm it is probably more desirable to inject it in or near the seat of spasm than in the case of its anodyne use. The temple is the most convenient locality. Electricity has been largely used and has been highly praised by some of its advocates, but in nine-tenths of the cases it fails even to relieve.

Stretching the facial nerve has been of late adopted in these cases, but unfortunately with imperfect realization of the hopes that were entertained when the operation was introduced, and

that seemed to be justified by its immediate effect. However trivial many of these cases seem to be, they often cause more annoyance than many diseases of far more serious nature.

The great tendency of to-day is toward specialties in medicine. The specialist, this of course includes the dentist, is too much inclined to become confined to his branch of study and to ignore the human system as a whole, unless he has been well grounded in general practice of several years duration.

In conclusion I would say that the most successful specialist is he who is a good general practitioner, from whose practice has grown his special work. The best all-around dentist is he who has been and is a good general practitioner. It can safely be laid down as a postulate that the dentist who is incapable of weighing in the balance carefully the necessity for increasing or restraining the organic functions of the human body, with their infinite permutations and combinations incident to disorder and health, is he who will do a great many things which ought not to be done, and will leave undone many things which ought to be done for the best interests of the patient.

DISCUSSION.

DR. OLIVER, Indianapolis, said: Habit spasm, or preferably habit chorea, as produced by dental irritation, is a peculiar malady usually found affecting the muscles of the face and neck, more often observed in females than in males. It is noticed to be more liable to occur about the time of dentition, either at the eruption of the deciduous teeth, during a period of time existing from six months to two years, or at the eruption of the permanent teeth from five to thirteen years, or at the eruption of the wisdom teeth from eighteen to thirty years, and in some rare cases at the eruption of a tooth of the third sense very late in life. Of course, this reflex neurotic condition may be present from some pathological condition of a tooth at any time of life, but I think these cases are of infrequent occurrence, and when they are found, are usually caused from such dental irritation as pulp stones, or an exostosis, constricting or impinging the nerve fibers, in which cases after a correct diagnosis the cause must be removed, when nature will take care of itself, with possibly such assistance as local and systemic stimulation. Cases of this kind rarely last any great length of time, the involuntary twitching

of the muscles ceasing after the peripheral irritation is removed, when the normal centrifugal action takes place almost simultaneously. The so-called teething spasms of babies usually subside after the tooth has forced itself through the alveolus and gum.

The fact of teething spasm being no more or less than a form of chorea is a much-disputed question, but I feel satisfied in believing that such is the case. Who among us, that has witnessed the agonizing expression, the distorted face, accompanied by the involuntary jerking of the voluntary muscles of the face and neck of baby, can deny that in addition to the slight remittent fever there is a reflex neurasthenic condition, a choraic spasm present? This condition happily disappears after the eruption and does not need extended therapeutical treatment.

In behalf of the cases presented caused by dental irritation during the eruption of the permanent teeth between the years of five and thirteen, I will say that these are probably the cases that last longer, are harder to combat, and cases where the old-time practitioner must leave the rut in which he has been traveling so contentedly, and use his therapeutical knowledge diligently. If a child is affected with choraic movements, it will be found that in ninety per cent. of all cases which have been produced by dental irritation, to have commenced with the eruption of the sixth year molar, and if there is a choraic tendency, that is, if he has inherited this pathological condition from his parents, or if his family history is of a phthisical, scrofulous, rickety or syphilitic character, then usually the habit spasm will continue with more or less frequency until after the eruption of the second molar at about the thirteenth year, at which time there will be a lengthened cessation, until the wisdom tooth again starts the trouble. In these cases arsenic is the most valuable remedy. Fowler's solution can be given after meals, commencing with three drops three times a day, and increasing the dose from time to time until the child takes ten drops after each meal, provided, however, that nausea, edema of the eyelids, or other toxic effects of the drug do not appear. Iron, cod liver oil and quinin may be given in combination with arsenic, if the condition of the patient is anæmic, or if good results do not follow the use of arsenic alone. Certain precautions, however, should be exercised in reference to the child, by its parents and associates. Study

should be interdicted, plenty of good food and fresh air should be provided, encouragement and praise should be freely bestowed as aids to the child in its attempts to conquer the choraic habit. Anything which disturbs and annoys the patient does harm. Such, for example, as mimicry, confinement to the house, deprivation from reasonable pleasure, or unnecessary crossness of a parent. Many a child has been scolded and even whipped for not ceasing to make faces when the action was entirely involuntary of the child's will.

Perhaps the most trying form of this disease is where it is produced by an arrest in the eruption of the wisdom teeth. Here is where the fine discrimination of diagnosis is necessary; especially is this true in the cases of young women. How frequently we hear of young women being dosed incessantly and even operated upon for so-called female weakness, when nothing in the world obtained but choraic spasm, perhaps produced from dental or ocular irritation.

One case occurred in my own practice, Miss D. being in the hands of the physician and treated for eighteen months for supposed uterine trouble, showing itself in reflex muscular spasms of the face, neck and shoulders. She was referred to me to have a rigid examination of her teeth made, after complaining of severe pain under the eye in the region of the left malar bone and in the left fauces. I finally discovered an impacted left superior wisdom tooth. After its removal, under an anæsthetic, with a portion of the necrosed process, she grew rapidly better, the pains and spasms ceasing, and was enjoying her usual health in about three weeks.

In regards the choraic symptoms presented from the eruption of a tooth of the third set, one case of which I have seen, I will simply say that a removal of the cause, with possibly a general tonic for a few days, in combination with a local stimulation, is all that is necessary.

Dr. BARRETT, Buffalo, suggested the idea of habit spasm being due to nervous force becoming accustomed to flow in some particular direction. The remedy was to use some agent that would cause this force to flow in another direction. This might be accomplished by the use of counter-irritants, scarification or other means that, by metastasis, would produce a cure.

Dr. MORSE asked what the indications were for the removal of teeth, as suggested in the paper?

DR. LOEFFLER replied that all teeth that can be saved and made serviceable should be preserved. Those that could not, ought to be extracted.

(To be continued.)

AMERICAN MEDICAL ASSOCIATION.

DENTAL SECTION.

THE forty-ninth annual session of the American Medical Association was held in Baltimore, Md., May 7-8-9, 1895. Of the Dental Section Dr. M. H. Fletcher, Cincinnati, was chairman, and Dr. E. S. Talbot, Chicago, secretary.

We present abstracts of papers read as follows :

THE VALUE OF DIFFERENT DIAGNOSIS IN DENTISTRY.

This paper was the production of Dr. Vida A. Latham of Chicago. She said :

The subject of diagnosis is one of great importance and the man who can diagnosticate rapidly and correctly is usually successful in his profession.

Diagnosis is valuable not only for treatment; but it enables you to form an accurate opinion as to the future course of a disease.

It seems a curious fact that works on dental surgery are so very imperfect and rambling on the subject of diagnosis. This is a matter of regret and also that research is so slow in progress—that is, slow in availing itself of so many new facts introduced from science generally. What is the reason? I am afraid it lies in five reasons :

1. The hurry to obtain a diploma.
2. The study of only just what seems absolutely necessary in the practice of dentistry, and a corresponding inability to apply general principles.
3. The fear of encroaching on general medicine.
4. Insufficient preliminary education.
5. Lack of a thorough knowledge of the normal conditions; and a habit of relying too much upon one mode of treatment. . .

The most difficult problem we have to diagnosticate in dental pathology are the neurological. Dental irritation is one of the

commonest and most powerful causes of reflex nervous disturbances. We all know of many cases treated by the medical profession for months which might have been relieved by attention to the teeth. Understand I do not mean to omit the medical treatment of such diseases as syphilis, malaria, neoplasms, etc. . . .

With regard to the etiology of dental periostitis and pulpitis, the diplococcus pneumonia may be regarded as a factor, usually accompanied by the staphylococcus, pyogenes, aureus, and albus. Pulpitis may cause inflammation of the antrum just as well as a severe catarrhal inflammation can do so. . . .

Causes of neuralgic pain are:

1. Sensitive dentine. 2. Fibroid pulps. 3. Crowding.
4. Necrosis of pulp in a confined space. 5. Exostosis. 6. Alveolar periostitis. 7. Filling over exposed pulp. 8. Malpresentation of third molar. 9. Rheumatic and gout diathesis.
10. Arsenic and chlorotic states. 11. Serumal calculus on roots.
12. Malaria. 13. Pulp nodules. 14. Sympathy. 15. Recession and absorption of gum and alveolus. 16. Pressure of gases in the pulp chamber. 17. Traumatism.

The most pernicious form of neuralgia is that which is due to septic influences occurring after some traumatic injury in which paresis or paralysis of the nerve affected sometimes follows:

Differential diagnosis between antral abscess and ozæna. Points in favor of the former are: 1. The presence of pulpless teeth. 2. A shortening of the face from the oral cavity to the orbit. 3. Accumulation and reaccumulation of pus, showing at the hiatus, in middle meatus, half an inch from anterior extremity of inferior turbinated bone. 4. Discharge of pus increased on putting patient in horizontal position, especially on the sound side. 5. Relative darkness over the exposed maxilla when the bones of the face are illuminated. 6. Puncture through nose and aspiration of fluid. 7. The presence of carious teeth, especially roots, in the upper mandible.

Ozæna is recognized by:

1. Characteristic fetid discharge. 2. Olfactory anesthesia.
3. Detection of denuded necrosed bone in nares. 4. Presence of crusts of dried secretions and ulcers, especially in naso-pharynx.
5. The teeth may be normal. 6. Diathesis, (syphilitic or strumous.)

The following appended tables may be useful in diagnosing:

SENSITIVE DENTINE.

When an examination over a considerable part of the cavity walls does not respond to simple pressure. Pain is not persistent.

HYPEREMIA OF THE PULP.

Pain of boring character, tooth highly sensitive to hot and cold temperatures. Painful in mastication and on pressure. Hard to distinguish from

EXPOSED DENTINE.

Absence of throbbing pain—pathogenomic of pulpitis; serious neuralgia may be a symptom.

CHRONIC PULPITIS.

Pain less severe than in acute form, not very intense nor long in duration when present. Comes on at irregular intervals—often vague neuralgic pains, sudden changes of temperature, or applications of irritants will produce a paroxysm of pain lasting from a few minutes to hours. Pulp shows inflammation limited to exposed spot, the rest pale and healthy.

IF THE PULP IS SENSITIVE.

When the examination is made near the pulp it responds to pressure.

PULPITIS.

Pain of a boring character, rapidly increasing, assuming a throbbing form, extending from the diseased tooth to the neighboring teeth and to the side of the face, the tooth forming the center of its intensity. The larger and younger the pulp, the greater the pain. In time the pain subsides, to return, though, on the slightest provocation, or the horizontal position being resumed. Pulp injected with blood throughout, the exposed part deeper in color.

NECROSIS OF PULP.

Pain becomes changed to a dull heavy ache, with a feeling of tension. Tooth feels too long, is raised in alveolus by the pericementitis and periostitis, and loosened. May have some swelling at the side, on the gum, or at the root, a change of color can be seen by strong light, the dead tooth having a dark line in the pulp region.

It is often difficult to distinguish pulpitis from hyperemia.

In hyperemia the throbbing character of the pain is not so well marked and the pulp usually not exposed.

Pulpitis must also be distinguished from periostitis, the differential points being as follows:

PULPITIS.

Pain sharp, lancinating or throbbing, intermittent and reflected within the tooth.

Thermal changes cause pain.

Pressure or percussion on tooth gives no pain at first.

Slight pressure on a piece of cotton in cavity generally gives acute pain.

With pulpitis we have pericementitis by continuity.

PERIODONTITIS.

Pain dull, heavy and constant, and without the tooth.

Thermal changes do not cause pain.

Pressure or percussion on tooth gives pain from the first.

Slight pressure does not give pain except through pressure transmitted through the periosteum.

Tooth loosens and elongates.

No diagnostician who is conscientious as well as competent will set up his own opinion as the standard, but will always rely upon the perception of those to whom he wishes to make the diagnosis plain, and in this very idea is the safety; for the recapitulation of the case may reveal points previously unnoticed, so giving certainty and confidence to the patient and himself. To become a good diagnostician it is imperative to understand principles and laws, in place of formularies and modes; and to comprehend these one's powers must be not only good but kept in constant use, thus insuring the best and latest methods, reading and experience.

THE SPECIFIC TREATMENT OF NECROSIS OF THE ALVEOLI AND MAXILLA WITH AROMATIC SULFURIC ACID.

In his paper Dr. W. A. Mills of Baltimore gave some of his experience with this old time treatment. He cited a case of necrosis superinduced by chronic abscesses. The necrosis extended from the left central to the right bicuspid. Treatment consisted of:

Acid sulfuric aromatic	-	-	3 ij
Aqua	-	-	fl. 3 x.

To be injected into fistulous opening, by patient, five or six times per day. Bicarbonate of soda to be used as a mouth-wash after each injection. At end of two weeks discharge ceased and cavity was packed with :

Carbolic acid C. P.

Tinct. iodin aa	-	-	3 ij
Aqua	-	-	fl. 3 xij.

The following day this dressing was removed, the nerve canals of devitalized teeth were opened, disinfected and filled. Patient instructed to syringe out cavity twice daily with the carbolic acid and iodin wash, as long as syringe could be used. In five weeks the parts were again in normal condition.

The second case cited, the necrosis extended from the inferior cuspid to cuspid. Fistulous openings presented at the right of the left inferior cuspid and at the left of the right inferior cuspid, and pus was copiously discharged. This condition had continued for over a year, although a number of physicians had prescribed for it. A surgeon told the patient that all of the incisor teeth would have to be removed before a cure could be effected. This the subject would not submit to. Treatment in this case was similar to case No. 1, and cured. All the teeth were saved intact.

In conclusion, the essayist said : The excuse I have to offer for my paper is to call the attention of the surgeon, no matter how prone he may be to operate, in the oral cavity, not to do so before he has failed in the sulfuric acid treatment ; or use more conservative surgery than is usually practiced in similar cases.

COMMON GROUND FOR MEDICINE AND DENTISTRY.

Dr. Joseph Roach, Baltimore, said :

While the work of the average dentist may be mechanical, the fact that both he and the surgeon work in the human body, makes a bond of union between them which is worth study, in as much as whatever links in this bond are found to be the common property of both ; are of much greater interest than any dissimilar joints.

Of the maladies of common interest I wish to mention those often obscure and occasionally grave diseases that involve the

maxillary sinus. This is obvious for the reason that in such cases the dental surgeon very often is apt to be the first observer on the ground. Whether he take the cases himself or turn them over to the surgeon he should be able to accurately diagnose the trouble.

He spoke also of impacted and abscessed third molars often causing serious pharyngeal trouble. He said: The lower molar is often too large for the space between the second molar and the angle of the jaw. In consequence its eruption is so interfered with that it may be either only partially erupted or may be impacted at an angle against the second molar, appearing through the gum slightly or not at all. Abscess of this tooth often evolves not only the tissues immediately around it but the tissues of the throat become inflamed and grave results ensue. Abscess opening into the pharynx is certainly one of the sequellæ of this trouble.

CHAIRMAN'S ADDRESS.

Dr. M. H. Fletcher, Cincinnati, in his address referred to the fact that all the professions which have man himself for their subject, which aim to rectify his physical deficiencies are to-day, and always have been of greatest interest, their scientific advancement in the past decade is more marked than in any previous one, but our lack of knowledge is still very great.

In the course of the address the essayist said: There is one feature of education in both dental and medical colleges which I consider of the greatest importance. It is that of having suitably trained instructors in our colleges. This I deem to be as great a defect as any at the present time, in our system of teaching. . . .

It is not an uncommon thing to find in a class, students who outrank many of their professors in strength of intellect and natural ability. Not only these but all students have a right to demand that their instruction be presented to them in the best possible manner.

It is a perfectly easy matter to get professors for the asking, but trained teachers are rare; and even those who have the natural qualities to become good instructors are not numerous. No one doubts that we have professors in almost every college who are capable, but on the other hand a greater number fall far short of this standard.

I believe a majority of students in all colleges are industrious and of good intent; and many of them are barely able, financially, to carry them through a three or four year's course. Such students if denied the full measure of their capabilities to receive, are defrauded of both money and time, the first of which never is, and the last, never can be repaid.

There are no normal schools, so far as I know, for the proper training of dental and medical teachers, and if there were, it does not seem practicable for many of our eminent practitioners—who are in other respects most suited for the position of instructors—to leave work and go to other localities for such training; but such a normal school it seems to me is demanded in some suitable form and it would seem a most fitting topic for discussion and action by our National Association of Faculties.

The distance a missile flies and the velocity with which it goes, is exactly proportional to the force which impels it. The analogy holds good in our colleges, for students of high grade can not be graduated unless the force can be found in his alma mater to produce the desired result; consequently it would seem no more necessary, if as much, to lengthen the term of college, increase the curriculum and raise the standard of entrance, than it is to increase the quality and ability of college instruction.

THE DESTRUCTION OF CHILDREN'S TEETH, CAUSE AND PREVENTION.

This paper was read by Dr. J. G. Henisler, Baltimore. He attributed the destruction of teeth in children, to neglect and ignorance as to the proper time and means of caring for the teeth. As a means of prevention he suggested that physician's watch the mouths of children and if decay appeared on the permanent teeth to send patients to a dentist. Another means suggested was to educate patients themselves.

ILL DEVELOPED ORAL CAVITIES, IRREGULARITIES AND SOME OF THE CAUSES.

In his paper on this subject Dr. W. S. Twilley, Baltimore, said that among the causes of irregularity of teeth is the resistance offered the permanent teeth by the temporary ones. Another frequent cause is a want of simultaneous action between the increase of the permanent teeth and the decrease of the temporary, by absorption of their fangs. When the permanent teeth

are large and the growth of the jaws does not proceed proportionately, they are found to crowd and overlap. By premature extraction of the temporary teeth, the jaws are liable to contraction and when the permanent teeth appear, there not being sufficient room in the arches, they will crowd and overlap. Again, where the upper incisors extend inwards and come in contact with the lower centrals, the child finds it easier and more comfortable to throw the lower jaw forward. This finally becomes habitual and promotes the increase in the length of the lower jaw itself. The almost universal acceptance of the theory that the premature extraction of the deciduous teeth, or the extraction of the permanent ones, are the only causes of irregularities, is a great error. Many cases of irregularity are due to neoplasms and hypertrophies, as these growths in children would cause a diminution of the normal contours of the bony framework of the oral cavity as well as that of the nasal.

ARCH OR SPAN FILLING.

DR. W. A. Mills, Baltimore, read a paper on this subject. He described his method as follows: Take for example two superior bicuspid teeth which have space the sixteenth of an inch between them. I wish to fill with gold. In this case I have cavities on the proximal surfaces, otherwise I would make them. Prepare cavities as though they were to be filled separately. Be sure to make the anchorage as strong as possible as they become the abutments of the arch when completed. Set an orange-wood wedge firmly between the teeth. Bind teeth firmly together with German silver wire, to prevent any spreading of teeth during the packing of the filling material. Fill the space with oxyphosphate mixed rather stiff, forcing sufficient cement over and against the buccal and palatine surfaces of the teeth to form a matrix. Before the cement sets too hard remove it from cavities in the teeth, and a sufficient amount of the space to give proper form to the arch, buccal and lingual surfaces of the filling, then proceed to fill as though it were a single cavity. When filling is completed, remove rubber dam, matrix wedge, and binding wire, then polish filling.

With an amalgam filling the same process is used except that gutta-percha is employed in place of the oxyphosphate and this and the binding wire are not to be removed until twenty-four

hours afterwards when the filling can be dressed and polished.

I do not recommend these fillings only where necessity demands.

MISSISSIPPI DENTAL ASSOCIATION.

ANNUAL MEETING, 1895.

Reported for OHIO DENTAL JOURNAL by Mrs. J. M. Walker.

The first paper was read by DR. J. P. BROADSTREET, Grenada, Miss., under the title,

THE CARE AND DEVELOPMENT OF THE TEETH.

Opening with the statement that "Dentistry has arrived at that advanced stage, to-day, that we are not only able to arrest the ravages of disease and decay in the oral cavity, but, with the proper means, and the cooperation of our patients, to prevent in a large measure the occurrence of the appalling conditions too often seen," he continued as follows: that these conditions are not now generally prevented, he attributed to the criminal negligence of part of the profession in educating the people along this line. He said: "Can we, who pose as members of one of the foremost professions of the age, hold ourselves guiltless, while we sit supine and indifferent and see this destruction and ruin continue its direful course, and never raise our voice against it, and never take a step to put a stop to it?" . . . "We will not have performed our full duty as members of our profession; we will not have felt the requirements imposed upon us by virtue of our profession; we will not have met the obligations and performed the duties we owe to the people, until we shall have exerted ourselves to our fullest capacity to impress upon the parents the necessity and absolute importance of caring for the teeth of their children."

He dwelt upon the nature of the information in regard to the formation and growth of the teeth, that should be given to prospective mothers the importance of the observance of the laws of hygiene; the best means by which to reach the people, teaching the importance of caring for the baby teeth from the time they first appear, and of preserving them until nature's use for them has ceased, and especially of impressing the fact that the sixth and twelfth year molars "*don't have to be shed*, and will not be replaced if they are allowed to be lost."

In the discussion of the paper DR. WESTMORLAND dwelt upon the importance of guarding children against eruptive diseases, during the formation stage of the teeth, and spoke of two cases now under his own observation, where the twelfth year molars were seriously defective from the effects of interrupted nutrition due to measles.

DR. D. R. STUBBLEFIELD endorsed the paper as striking the key note in the science of dentistry—"The dentistry of the future will be greatest along the line of prevention and sanitation."

"The dentist is the doctor for the teeth, and a 'doctor' is a 'teacher,' and it his duty to *teach* his patients." He said: "I want no better means of judging a man as a dentist than to stand behind a screen and listen to his conversation with his patients. . . . A responsibility ever-present and far-reaching is that of teaching your patients. . . We must not only *do* the best we know how, but we must supplement it with careful teaching. . . . I think that every State Association, and the National Association should combine in action along this line."

DR. J. Y. CRAWFORD spoke with his well-known enthusiastic earnestness upon this subject. He said: ". . . If I have ever done any good in my life, in any particular way, I may say, without egotism, it is in the little I have contributed along this line. . . The fact that ninety-five per cent of the American people have diseased and decayed teeth, is a fact that challenges the attention of the professional world—of the medical world—nay, even of the political economist, and especially of the financier who would make *gold* the only standard, for it is an admitted fact settled by statistics, that one-tenth of the entire output of gold for any current year, is used in the treatment of the teeth!"

He spoke at length of pathological dentition as a factor in infantile mortality and outlined the conditions conducing to this result. He attributes much to the pernicious effects of the improper use of the rubber nipple of the nursing bottle, causing pathological conditions of the upper jaw when cutting the upper incisors. Mothers and nurses all look forward with anxiety to the time when baby will cut its "stomach" and "eye-teeth." They have inherited this fear from long generations of mothers and nurses, without seeking the cause for the trouble which they know however does exist. Wise men may argue that from the shape of the teeth they should come easier than any of the others, especially easier than the large molars which have given us special trouble; but mothers know better. And they are right; there is a reason for the difficulty with which the cuspids erupt. Why? because they get bound down and caught between the baby molars and the laterals.

After the centrals and laterals have come in, a gap is left and the molars come in next, and they fill up part of the space required for the cuspids? Why? Because disregarding the law of nature, which prescribes a use for every thing that is, the molars are not used as it was intended they should be. Instead of weaning the child, when the eruption of the molars indicate the readiness for more solid food, by which the teeth can be used and the jaw developed, the child is kept at the

breast or hugs the bottle all day. Wean the child ; take away the bottle, when he has the four first molars, and your children will not have convulsions and die, when cutting "the stomach and eye-teeth." The jaw needs the benign influence of function—action. And when the child has got its teeth, see that they are kept clean, and you will keep them sound. Do not allow them to decay, so that every mouthful of food that is swallowed goes into the stomach loaded with pathological germs. The teeth must be kept in condition to perform their natural function, that of insalivating and sterilizing the food. The saliva in an aseptic condition of the teeth and mouth, is nature's great antiseptic ; keep it healthy and pure. A parent comes into your office and brings a little child four or five years old, the teeth decayed, the pulps dead, the gums inflamed, and says: "I want those teeth pulled out ; the child cries so at night that I can't sleep ; haven't slept for four nights." No ; and he ought not to sleep for four years for allowing those teeth to get into that condition ! This is one of the greatest sins of the nineteenth century. Avail yourselves of all the scientific resources of your profession, if necessary, in the relief of those pathological conditions. Save those teeth until it is time for them to be lost. If the pulp is dead, the roots will not be absorbed, but restore them to a healthy condition, fill them, and then cut them off from time to time ; make them non-antagonizing, and exfoliation will supplement non-absorption. Keep cutting them down as they protrude, until you reach the bifurcation of the molar roots, and they have served their purpose, and then you can take out what is left of the roots, and you will soon see the beautiful bicuspid appear. One of two things follows the premature loss of the baby molars. Either the bicuspid erupt too early, or they are retarded, and sometimes encysted. When the child is five years old you know there are twenty-eight permanent teeth well advanced in the process of calcification. A fistulous tract at the root of a baby molar establishes communication between the outside world and the crypt of the permanent tooth, and by a supreme effort of nature, the bicuspid erupt when the child is only five years old. Or if this does not happen, the bicuspid may be permanently encysted as the result of the premature extraction of the baby molar.

The next paper read was entitled,

AN UNIQUE CASE IN AMPUTATION OF TOOTH ROOTS.

By DR. W. E. WALKER, Pass Christian, Miss.

He claimed that the case was *unique*, because, with every tooth in the mouth absolutely free from decay, one root of each of the four first molars was abscessed and necrosed.

The patient first presented in the spring of 1892 for treatment of an

abscess of the lower first molar. He found that the pericementum was entirely destroyed over the whole surface of the posterior root, with pus discharging all around the gingival margin. This condition had existed for a number of years, the resulting chronic inflammation having developed an ugly looking tumor-like growth of the gum. Drilling into the perfect crown, the anterior roots were cleansed of putrescent contents, and when ready to fill, the posterior root was amputated at a line just above the gum margin to the point of bifurcation. The anterior roots were then filled, and the pulp-chamber filled with gutta-percha, pressed out through the point of amputation when it was smoothed off with a warm instrument on the under surface. The Morsal opening was filled as usual. The season being far advanced, the patient then left for his northern home, without treatment of the tumor on the gum or of the three other first molars which were also abscessed, having been in that condition, as stated by the patient, for about twenty years. The patient presented again in the spring of the present year, 1895, requesting that the other three molars receive the same treatment. The operation had proved a perfect success. The tissues were in perfectly healthy condition, the tumor which had been very ugly looking having entirely disappeared without any further treatment. The socket of the root removed had entirely filled up, and to the eye there was no visible sign of anything unusual. Probing with the instrument alone showed the absence of the posterior root. The three other first molars had each one necrosed root—the posterior root in each of the lower first molars, and the lingual root in each of the upper first molars, in a necrosed, foul condition, coated with urinary calculus. The teeth were perfectly sound (as are all the teeth in the mouth, no caries having appeared.)

The patient is a man of some eminence in the literary world, of perhaps forty-five years of age, and by no means robust, being a close student. The diseased root being amputated as in the case described, the chronic abscesses healed with no further treatment.

DR. STUBBLEFIELD said: We can all look back to cases of which we might say—"the amputation of the root of that tooth would have been the correct thing." We recognize the conditions requiring the operation. If the root is incurably diseased, denuded of periosteum, we have a condition creating constant irritation and good judgment dictates the removal of the diseased bone. In single rooted teeth the extent of the disease should be carefully noted, and as much of the tooth structure saved as possible. But in all cases we should have the boldness to back up our judgment and, as dental surgeons, perform the indicated surgical operation. The pockets around necrosed roots are nature's protest, demanding the removal of the cause of irritation.

DR. FRANK HOLLAND thinks the operation is more easily described than performed.

DR. J. Y. CRAWFORD. If I were to write a book on practical dental surgery, I should certainly include the operation of root amputation. Any system of dental surgery that does not include the operation under consideration is certainly deficient. If the case fails to yield to curetting, then root-amputation must be resorted to. Save as much of the tooth as possible, or, like the partially absorbed baby tooth, it may be prematurely luxated.

DR. WALKER. In the case I have described, the roots amputated had no vital attachment whatever.

(To be continued.)

ALL SORTS.

Taking an Impression.—Dr. W. G. Browne gets most excellent results with modelling compound. He puts the tray in the mouth and tells the patient to bite upon it and hold it there himself.

Rubber-dam.—Old, weak rubber-dam may be restored by immersion for five minutes in a weak solution of ammonia water. It will also relieve the rubber of its offensive odor, which is so objectionable to patient and operator alike.—*D. E. Wiber, in Med. Brief.*

To Check Decay in Superficial Caries.—In superficial caries, cut out the decay and dry thoroughly with chloroform. Then soak the cavity with melted paraffine and further decay will be prevented. This method is much superior to nitrate of silver, which blackens the teeth.—*Journal U. of M.*

Lysol as a Sterilizer.—An effectual sterilizing medium is made of lysol 34, water 512. Make solution alkaline with common baking soda, or any alkaline substance. Broaches, excavators and other instruments may be left in the solution 2-5 minutes. There is no corrosive action.—*Journal U. of M.*

For Sensitive Dentine.—Dr. C. E. Francis, in preparing sensitive teeth for filling, uses a solution of bi-carbonate of soda in electrozone. He saturates the cavity with this and then proceeds to excavate, renewing the application whenever necessary, and finds that it modifies the pain to a considerable extent.—*Dental Practitioner and Advertiser.*

Hints.—In stamping the cusps of shell crowns, use a lump of wax with cotton over it, instead of shot. This gives a better contour to the sides of the crown.

To finish rubber plates use about one-third emery with pumice. Saves half the labor and time. The palatal surface is covered with oil of glycerin to remove the last traces of plaster.—*Journal U. of M.*

Protection of the Teeth.—Tell your patients, when taking muriatic tincture of iron, to use Vichy water as a medium. The most economical method is to procure the salts of Vichy, kept in all first-class drug stores. A quarter of a teaspoonful in three ounces of water forms a safe medium, rendering the iron easier of assimilation and preserving the teeth from the injurious effects of the acid.—*C. B. Colson, in Items.*

The Stability of Hydrogen Peroxid.—A German chemist, Wolfenstein, has observed that hydrogen peroxid is much more stable than is commonly supposed. A solution containing 4.5 per cent. can be evaporated on a sand bath until the percentage rises to 66.6, the loss is considerable when the strength is over 15 per cent., but is due to vaporization, not to decomposition. Such evaporation, however, can only be successfully accomplished if the solution be free from every trace of alkali, compounds of heavy metals, and solid bodies of any kind, even if chemically indifferent. By concentrating a solution—by shaking with ether, evaporating the ethereal liquid, and fractionally distilling into a vacuum (68 mm.) at 70°-80° C.—a product was obtained containing 99.1 per cent. of hydrogen peroxid.

Gold Collars instead of Fillings.—In an article in the *British Journal*, Dr. H. Pedler says: "We often come across cases where the patient complains of a gold wire or band on a plate cutting away the enamel and making the tooth very sensitive. This may be so bad that if any acid gets between the band and the tooth in eating, the patient has to leave the table and take the plate out.

I find that by putting a gold collar round, and placing the clasp on the outside of this band, great relief may be obtained. It is especially applicable, for instance, in the case of isolated molars and bicuspidis where the teeth are fairly square, and do not require much trimming. The collar is fitted on as if making a gold crown without the top. It is then cemented on, and edge bevelled when the material has set. This method is less trouble than filling, gives no pain, and may also be used to protect old fillings, saving the tooth for a number of years."

German-Silver Matrices.—In a contribution to the *Dental Digest*, Dr. G. A. Bronson says: "A piece of German silver is rolled to No. 36 gauge, and cut in strips averaging 3-16 wide and six inches in length. The end intended for the teeth is rolled upon itself to a coil of 1-16 inch in diameter, and the other end to a coil of 3-16 to hold on by, or what is

still better, soldered to a ring to slip the finger in. Both coils should be filled with soft solder.

This form of matrix is especially useful for a number of difficult cases, where the older forms were lacking, such as the disto-lingual surface of a wisdom tooth, a proximal cavity where the adjoining tooth is lacking, etc. It is most useful for all plastic fillings, but at times comes in very well in operating with gold. It is quickly adjusted and removed, and owing to its extreme flexibility, its removal is less liable to disturb a new-made plastic filling than the ordinary form of matrices. The end with the large coil or ring is held taut by the operator or assistant."

Dies without Moulding.—"To make dies for small cases without moulding," says Dr. D. W. Barker in *Items*, "is to cast the dies directly on the model. A plaster impression being taken, a plaster model is obtained. With the tip of the finger dipped in powdered soapstone rub the model till smooth; build a wall of moldine, potter's clay mixed with glycerine, half an inch high around the model, covering the teeth and all parts not to be covered by the plate; the parts to be covered by the plate will then be at the bottom of a well with sloping sides; in this well pour lead until it is even full; the lead should be poured just before it begins to cool; separate this lead counter from the model, and around it build the wall of moldine as before, leaving exposed only the surface to be covered by the plate; with a ball of cotton held in the pliers and dipped in powdered soapstone, dab the surface of the exposed lead till it is covered by a film of the fine dust; in the well thus formed pour fusible metal, separate and swage as usual. By this method no time is lost making sand moulds, varnishing casts and waiting for them to dry, and the results will be found exact and satisfactory in every way."

A Red Line on the Gums.—According to Dr. Andreessen, of Yalta, this is frequently present in the subjects of pulmonary tubercle. In 800 patients examined, this sign was found in 92, and of these 69 were phthisical patients having bacilli in their expectoration, and other pathognomonic signs. In the 23 others in whom the line was present there was a suspicion of tubercle. In 14 cases of confirmed pulmonary tuberculosis the red line was absent, as was also the case in 33 patients in whom phthisis was suspected. The line may be readily recognized by its intensely red color, and cannot possibly be mistaken for the livid mark visible in persons suffering from chronic affections of the digestive tract. In the majority of cases in which the line existed, the affection was of a somewhat grave and acute character, while those cases in which the line was absent, the evolution of the morbid symptom was slow and comparatively benign. The line gets less when there is a general improvement

in the health of a phthisical patient, and again deepens if the pulmonary condition becomes worse. A similar mark is at times observed on the gums of pregnant women; so that under these circumstances the line is of less diagnostic value.—*Dental Record*.

Clasps for Partial Dentures.—To make a perfect-fitting clasp, obtain a true model of the mouth, and having decided which teeth you intend clasping, take a strip of tea lead or heavy tin foil of the required width, and fit it accurately to the plaster tooth, shaping the edge next to the gum in conformity with the irregularities in the latter around the neck of the tooth. Cut an exact counterpart of the pattern thus obtained from a piece of clasp metal, about 27 or 28 Brown & Sharpe gauge. This should be conformed as perfectly as possible to every portion of the surface of the tooth embraced by it; remove the clasp and cut a counterpart of pattern from a piece of pure gold plate, 36 gauge. Having previously studied the articulation, cut this metal, allowing a small end to extend onto grinding-surface, at a point where it will not interfere with the bite. This material being thin, can be fitted perfectly to the plaster tooth. Bending the end down onto the grinding-surface and place the previously made clasp directly over it, fill up the intervening space with hard wax; when cold, remove the whole clasp carefully from tooth, invest, and flow solder between the two clasps. Fit the clasps to the other teeth in the same manner, and proceed as usual. If the clasp is intended for vulcanite plate, attach a strip of gold or platinum to it, in such a position that it will be inclosed in the rubber.

The advantages of this clasp are perfect coaptation, excluding all solid substances from between the clasp and tooth; preventing decomposition of food, and pressure of the plate on the gum tissue.—*F. Messerschmitt, in Cosmos*.

Treatment of Decay of the Deciduous Teeth.—In an article in the *Dental Headlight*, Dr. L. G. Noel says: "I wish briefly to put before you a modification of the present practice in the treatment of the decay of the deciduous teeth, which I believe to be new; so new indeed that I have not myself had an opportunity to test its value; yet only an idea in my mind. It will take time to test it. I would suggest the free separation of these temporary molars as soon as it becomes evident that they are decayed, with knife-shaped corundum disks, making a decided V-shaped opening that cannot possibly fully close. Where the sixth year molars are in place and there is decay on the distal surfaces of the second deciduous molar, I should use safe-sided files of the ancient style, and carefully avoid cutting the enamel upon the permanent teeth. After making free separations I should treat freely with silver nitrate, and in-

struct the patient to return for additional treatments until a thorough blackening and ebonation of the dentine was obtained. Where the decay is extensive, nearly reaching the pulp and so deep that the file or disk fails to entirely remove the decay, I propose the scraping away with spoon-shaped excavators of the softest portions, after having first thoroughly blackened and sterilized the cavity with the silver nitrate and giving time for structural changes to take place underneath, repeating the cauterization until a smooth, hard, though possibly somewhat concaved, surface is obtained. I would also propose the thorough cauterization of all grinding surface cavities before fillings are inserted into deciduous teeth. The application of the above ideas to the treatment of other cavities I leave for you to think about, believing it worthy of your consideration."

The Fitting of Clasps.—There is a prejudice against the use of metal and other clasps for retaining artificial dentures, because it is believed that they wear the teeth. It is not an infrequent occurrence to find a deep channel about a tooth that has been clasped, and both patient and dentist jump at the conclusion that it has been worn by the clasp. Careful observation will usually show, however, that the deepest erosion is where the clasp is not in direct contact with the tooth at all. Further, an accurate, closely fitting and narrow clasp will not cause as much erosion as one that touches only at certain points, while at others it stands away from the tooth, and which is wide and encroaches upon the gingival margin.

In most instances the channel under the clasp is the effect of chemical erosion, and not that of wear at all. Especially is this the case when the plate covers a considerable portion of the roof of the mouth, and is comparatively immovable. In such conditions there should be but little wear, while the erosion is usually greater than under unlike circumstances. But food readily lodges beneath the clasp, and if it is so constructed that it is retained there fermentation soon ensues, an acid is generated and this dissolves away the tooth tissue. The more immovably the plate is held the less will be the probability of the dislodgment of the food, and the greater the erosion.

The remedy is in the use of rather narrow, close-fitting clasps, that do not extend above the palatal edge of the plate at the gum margin, thus forming a lodging place for food, and that are self-cleansing. Whenever practicable they should envelop the bulbous portion of the crown of the clasped tooth, be raised above the plate and united at one or more points by a metallic standard, one end of which is soldered to the plate and the other to the clasp. At no point will such a clasp be in contact with the plate, nor will it be soldered directly to it. There will be a

space between the two, interrupted only by the standard or standards, and the saliva will freely wash through this and keep the whole clear of food debris. Besides, the clasp attached in such a way will be much more effectual as a retainer, while it will be relatively stronger, because of the peculiar leverage.—*Dental Practitioner and Advertiser*.

Diseases of Obscure Origin.—In an article in the *International Dental Journal*, Dr. H. Allen says: "Occasionally diseases of obscure character are located in the region of the maxillary sinus which do not readily admit of classification. A case of this kind may be here outlined: A gentleman reported suffering from pain in the right side of the face in which I was unable to determine the cause. After a futile study the patient was etherized and the parts thoroughly explored. The sinus was opened in front at a point posterior to the canine fossa. Everything was found to be in a perfectly normal condition. Nevertheless, the patient rapidly recovered. Opening the sinus thus cured a pain which was centered in the region of the face.

Let me narrate a second case. Localized neuralgia of the nature of tic douloureux was confined to the tissues upon the right side of the face in a married woman aged thirty. The parts were swollen, and the entire region of the cheek, including the malar bone, was unduly prominent. The pains were intermittent, attended with heat, flushing and convulsive movements of the muscles of expression. The skin was at all times braunny, shining with excess of sebaceous secretion, and of a redder color than that over the rest of the face. There was no discharge either into the nose or the throat; the molar teeth had been futilely extracted; the first bicuspid and the incisor were dead. The test of transillumination was negative. I etherized the patient and carefully explored the parts. The sinus was opened and found to be apparently normal; the cheek tissues were dissected up as far as the lower part of the orbit, and the infraorbital nerve dissected from the point of escape from the infraorbital canal, and a portion measuring one centimeter in length excised. The sinus was opened on a line with the canine fossa and found to be empty. It was packed with iodoform gauze, and, greatly to my surprise, on the following day on removing these strips they were found to be saturated with pus. It was not possible that the pus could come formed from a perfectly normal sinus in so short a time, and I inferred that there had been pus somewhere in the sinus before operation,—probably in the posterior part, which is occasionally provided with a septum-like spur, and thus in part separated from the anterior part. The recess may have contained pus. The patient made a good recovery. There has been no return of the neuralgia, but the empyema has been a little tardy in appearing. At this date, after a lapse of four months, the patient is

entirely free from neuralgia and subject only to very slight occasional purulent discharge from the sinus into the nose."

Theory and Results.—In an article on the above subject, appearing in the *International Dental Journal*, Dr. G. L. Curtis says: "The completeness of the lack of knowledge on the part of the average physician and surgeon concerning diseases attendant upon or following affections of the teeth, of the effects, near and remote, which such affections may cause in the organism, is appalling. Many times their patients suffer untold agony or endure prolonged illness because of the doctor's ignorance upon these subjects, which should be among the fundamentals. For much, if not all of this, the medical institutions of learning are responsible. In the curricula of many of these the teeth, for all the attention that is given to them and their diseases, let alone their anatomical and nervous relations to the remainder of the economy, might well be foreign bodies."

One case cited in the article was as follows: "A lad, twelve years of age, was brought to him November 12th for dental operation. Examination of the mouth showed an over-crowded arch resulting in irregularity of the teeth, which were very poorly calcified, and contained many sensitive cavities. In the inferior first molars were extensive amalgam fillings and several disintegrating spots. The pulps of the superior first molars were dead, and in reply to an inquiry as to why the lad wore glasses, his mother said, "By order of Dr. —, under whose care he has been for a long while for treatment of St. Vitus's dance of the eyes." The boy's eyes, lids, and brows were rapidly and constantly twitching, to the great discomfort of himself and those about him, and he was nervous and irritable. Dr. Ives's experience enabled him to quickly see the relation between the boy's trouble and the condition of his teeth, and he directed that he be taken to Dr. Hasbrouck for the extraction of the four sixth-year molars, with the promise that the extraction would cure his "St. Vitus's dance." This was done, and at the expiration of ten days the boy returned, without glasses, and all signs of irregular movements about the eyes had disappeared. The boy was then taken to the physician, a well-known oculist of good repute, with a statement of what had been done, but he repudiated the idea that the change was owing to the extraction of the teeth,—"it was impossible,"—and claimed that the cure was entirely due to his treatment.

These cases, all of which are of recent occurrence, point the idea previously expressed of the lack of appreciation among members of the medical profession generally of the important *role* which the condition of the mouth and teeth, more especially the latter, plays in disease. They can be duplicated by the dozen, but hundreds, alas, of the sufferers from

the protean effects of unsuspected dental disease never find relief because of the ignorance of their physicians."

Crown and Bridge-work.—In an essay read before the Oregon State Dental Society, by Dr. W. A. Cummings, and published in the *Pacific Coast Dentist*, we read:

"There are two important points to consider in making a Richmond crown. The first is the preparation of the root, which to my mind, is one of the most difficult things to accomplish. As yet we have no instrument with which we can trim the root to its proper shape. There are several in the market, but, unfortunately, they will not do the work properly. The best instrument that I have found is the one suggested by Dr. Starr, and with these scrapers you can do nothing better than pick off the remaining enamel and scrape the root as far as the band is to be extended under the free margin of the gum, so that, instead of being a cone with its base presented, that part of the root the width of the band to be used will be a section of an inverted cone. It is obvious that, when a root is prepared in this manner, the higher the band is forced on the root the tighter it will fit. This is the only correct way to shape a root, and I have found it a very difficult thing to do. The only way to properly appreciate this point is to be compelled to remove a root with a band upon it and observe the failure. This I consider of vital importance to the success of a crown with a root banded.

The next point is the color. After we have looked over all the teeth in town, and finally selected the best of the lot, it is very discouraging to find, after the work is done, that the tooth does not match in color. There is a fine point that only long practice and a good eye for color can overcome. In backing and soldering, the tooth assumes a dead leaden color, and the point is to select a tooth that will be the proper color after it is backed and soldered. Here is where the average dentist generally fails. How many Richmond crowns have you seen that do not show some difference in color when compared with the natural teeth desired to match? This is one argument in favor of porcelain teeth. This is one argument in favor of porcelain crowns. With a fair assortment of Logan crowns there is no excuse for not matching in color any tooth, so, without close examination, it would be difficult to detect the artificial one. The Logan crown is accepted by the majority of dentists as the best all-porcelain crown made. It is not difficult to match the color, but requires a large amount of brains in the ends of the fingers to *properly* adjust it; and for the six anterior teeth I am convinced we can find nothing better. For the bicuspsids we must have a different crown. A Logan or Bonwill is hardly strong enough in its attachment to the tooth to stand the force

of mastication, and bicuspid differ so much that it is very near impossible many times to get one that covers the root. The best bicuspid crown I know of is the English-tube tooth. With a strong post and a burnished cap of platinum the tube tooth secured to a pin with cement makes a first-class common-sense operation. The most admirable points about these teeth are that you can grind all surfaces, and if the crown be broken it is easily replaced. These crowns are not adapted to replace the six anterior teeth. Within the last year I have changed my mind in regard to a banded crown. I once thought that a banded crown was much superior to the unbanded porcelain, but experience, the true teacher, has taught me that a root properly crowned with a Logan is far superior to any banded crown. I was helped to this conclusion not only by my own failures but by the failures of others as well.

To my mind the ideal crown would be one that after the root is trimmed to its proper shape, and a perfect cap constructed and placed upon it so that one could be sure that there would never be any further trouble, with the root perfectly protected, free from irritation, with a strong screw-post in pulp-canal projecting about two lines from the cap, then a porcelain crown that could be secured to the root in some mechanical way—not with cement, or, at least, until we have one that the saliva will not dissolve,—so that it could be removed whenever necessary without disturbing the permanent cap on the root. . . .

One essential thing in a bridge is, that it shall be so constructed that, if it rests on the mucous membrane at all, the point of contact should be so small as to afford no lodgement for food. In other words, a bridge must be self-cleansing. Now to make a bridge that will not only replace the teeth, but the alveoli as well, and not have a large surface of the mucous membrane covered so that it will be self-cleansing, is an impossibility in a permanent bridge denture.

You will notice in our text-books that when an illustration is given explaining the manner of making a bridge, the first one shows the model of the mouth with the usual deficiency of teeth and alveoli; then the next with the bridge in position without any deficiency of the alveoli. I do not know who is to blame, the engraver or the dentist, for it is not explained how the space is filled.

Taking these things into consideration, I believe where there are both teeth and alveoli to be replaced, a permanent bridge cannot be constructed so as to give satisfaction to the patient or credit to the dentist; therefore, I make it a rule in my practice to construct a bridge only to replace one missing tooth, and the outside two, when the absorption of the process cuts no considerable figure.

Another rule I have is to place bridges only in perfectly healthy

mouths. At its best a bridge is useful only as an ornament, for the bridge-maker always constructs it so that the force of mastication will fall on the natural teeth. Therefore, it seems the favorite location for a bridge would necessarily be on the anterior teeth. Where there is any one of them missing, to place a Richmond crown on the tooth selected to carry the bridge and attach a plate tooth to it makes an ideal permanent bridge.

I do not believe in banding a tooth to carry one end of a bridge, or for the purpose of supporting the bridge itself. I have never seen one yet that did not work loose and destroy the usefulness the teeth it encircled.

It is a mechanical impossibility to fit a band around a tooth close enough to exclude the fluids of the mouth and prevent the cement from washing out, forming a lodging place for food and favoring conditions for rapid decay, as the band fits around the most vulnerable part of the tooth.

In replacing the anterior tooth with a bridge I remove the crown of the tooth that is to support the bridge, and as there is no irritation the conditions are all favorable to replace it with a perfect Richmond crown that will have sufficient strength to support the ornamental tooth. Some will say that the best practice would be to crown the tooth to support the bridge with a gold crown. I will admit this would make the strongest possible bridge; but I would rather see the space unoccupied than to be compelled to shade my eye from the glittering tusk. Happily, we can always turn to the old-fashioned plate when we hesitate to devitalize a tooth for this purpose. For myself I would rather run the small risk of losing another tooth than wear a plate. The only place I would use a gold crown to support a front tooth would be to place it on the bicuspid. To replace one anterior tooth with the bridge dentures just described I do not believe it can be improved upon.

In replacing more than one tooth with the always present alveoli our only salvation is in a removable bridge. After the teeth or roots have been properly treated and capped, then to construct a mechanical arrangement with not only the lost teeth but the lost alveoli reproduced and so adjusted that the patient can remove and clean it himself; this to me is the ideal bridge.

NEW PUBLICATIONS.

THE EYE IN ITS RELATION TO HEALTH. By Chalmer Prentice, M.D.,
Chicago: A. C. McClurg & Co. Price \$1.50.

This is the latest addition to medical literature and a remark-

able work. It is a record of results along new lines in the treatment of the eyes.

The author says, "Many ideas are set forth that are entirely new, and results recorded that appear incredible."

His theory of disease is that it is the result of "nerve strain. That all alterations of functions are primarily central in the nervous system."

"The *visual centers* are the most sensitive, and most constantly taxed, because the most continuous and positive feeling is produced by the impact of an imponderable agent—light."

Through reflex influence upon the brain, and thence acting upon supersensitive conditions of other organs, disease results.

These conditions are logically treated through the eye as "eye-strain" is the predisposing cause. This treatment is by "repression," or "the abatement of an excessive nerve impulse, accomplished by reversing a strain," together with surgical operations when there is lack of co-ordination of the muscles.

He gives extended accounts of many cases, which read almost like miracles, some of which I have seen.

In a list of tabulated cases, successfully treated, I may mention, ovaritis, prostatitis, insanity, asthma, rheumatism, diabetes, loco-motor ataxia, consumption, hay fever, functional heart disease, melancholia and sterility, constipation and catarrh.

It is a long step ahead in medical science and opens up new avenues of hope to suffering humanity. L. P. HASKELL.

GENERAL SURGERY AND PATHOLOGY FOR DENTISTS. By Edmund W. Roughton, B.S., M.D., Assistant Surgeon Throat and Ear Department, Royal Free Hospital, etc. London: J. P. Segg & Co., Pub., 1895. Philadelphia, U. S.: S. S. White Co., Pub.

This book of 134 pages is designed for a student's text book. The author has aimed at conciseness in the consideration of the subjects presented and in a number of instances he has left unsaid what would clear up the text and make the meaning better understood by the student.

In the Introduction we read: "In the following pages an endeavor will be made to set forth in as clear and concise a manner as possible, just so much surgery and surgical pathology as

the student in dentistry will find necessary for his examinations, etc."

Now it seems to us that this idea is a wrong one. The student should have *more* of all studies than *just enough to pass the examinations*. Such an expression, although perhaps unintentional on the part of the author, is apt to give a student a mistaken idea of what is most valuable to him.

He looks upon examinations as the *ne plus ultra*, and does not realize that knowledge itself is the essential. If the knowledge is obtained the examinations are easily passed.

The author's intentions may have been good but some of his expressions are vague and apt to be misleading. On page 21, eighteenth line we read :

"A few pathogenic organisms such as the anthrax bacillus, (bacilli?) seem to able to flourish in the blood of a healthy animal, provided *they* (?) have once been successfully inoculated, but the majority of them are only capable of," etc.

The word "*they*" is misleading and one not familiar with the study of bacteriology would take it that the bacteria themselves had to be inoculated instead of the animal.

In speaking of phagocytosis, at the bottom of the same page we read :

"If the vitality of the phagocyte is lowered, it is apt to find the bacterium too tough for its digestive powers, and itself dies like a soldier fighting for his country." Does the author mean that death of the phagocyte was due to the toughness of the bacterium, to the phagocyte's indigestion, or on account of the lowered vitality of the phagocyte, the bacterium was enabled to overcome it through its poisonous or other properties?

Again on page 51 we read about the treatment of hemorrhage. The author says: *Styptics* are drugs such as perchlorid of iron, tannin, matico, etc., which cause coagulation. They should be avoided as much as possible. The *cautery* acts by contracting the vessels, by charring the tissues. It may be used in the shape of an ordinary red hot iron, galvano cautery, etc."

This carries the impression that a red hot iron or the galvano cautery should be used in preference to tannic acid, etc.

In the illustrations of spore-bearing bacilli on page 19, we notice one bacillus with two spores. We supposed they had only one each. These are but a few of the misleading statements

throughout the book, which should be revised for the next edition. An author cannot be too exacting when writing a book for students' use. Aside from these statements the subject matter is excellent as far as it goes, but there are numerous places where a little more of the right material added would greatly add to the value of the book.

THE PRINCIPLES OF BACTERIOLOGY: A Practical Manual for Students and Physicians. By A. C. Abbott, M.D., First Assistant, Laboratory of Hygiene, University of Pennsylvania, Philadelphia. Second edition, enlarged and thoroughly revised. Philadelphia: Lea Brothers & Co., pub. Price-cloth, \$2.75.

The author of this book has a gift of expression possessed by but few. There seems to be scarcely a superfluous word in the whole text of 462 pages. It is so tersely and concisely written that no part of it should be misunderstood by anyone. After a brief review of the discovery of bacteria, the author takes up the subject of bacteria proper, giving their form, classification, morphology, etc. He then takes the student through a progressive course of *technique* that covers all the ground necessary to give a comprehensive idea of the whole subject. In addition to this, he takes up the subjects of *Infection and Immunity—Bacteriological Study of Water—Air Analysis—Methods of testing Disinfectants and Antiseptics*—concluding with a list of apparatus and materials required in a beginner's bacteriological laboratory. It is a valuable book for the student and practitioner and we can heartily recommend it.

USEFUL HINTS FOR THE BUSY DENTIST. By Wm. H. Steele, D.D.S. Philadelphia: The Wilmington Dental Mfg. Co., pub., 1895. Price, cloth, \$2.50.

The author of this book is well known to all of our readers by the excellent practical suggestions he has given from time to time in the OHIO JOURNAL. This second volume has been gotten up on the same plan as Vol. I., issued some time ago. The author says he has "endeavored to present to the busy, practical dentist the latest and best methods of our most skilled operators, and

best writers, arranged in such a manner as to be accessible at a moment's notice." This volume contains much more original matter than the first, and illustrations have been employed, which add greatly to the value of the work. Aside from the original articles, the book is made up of compilations from the various dental publications, and the OHIO JOURNAL has the honor of furnishing about one-fifth of the whole material presented. It is invaluable to the dentist as a book for ready reference, as it presents many ideas that will facilitate his daily work. The book is well indexed, printed and bound.

TRANSACTIONS OF THE SOUTHERN DENTAL ASSOCIATION, 1894. Philadelphia: The Wilmington Dental Mfg. Co., publishers.

The book is neatly printed and bound, but we find no index or table of contents. This is an unfortunate omission and we hope, for the sake of reference, that the next edition will not be found wanting in this respect.

SOCIETIES.

NORTHERN IOWA DENTAL SOCIETY.

THE annual meeting of the Northern Iowa Dental Society will be held at Clear Lake, September 3, 4 and 5. A good program has been prepared and a very interesting and instructive meeting is expected.

Thursday afternoon will be devoted to social enjoyment: A tour of the lake, regatta, etc.

For further information, or copies of program, address Dr. J. J. Grout, Rock Rapids, or Dr. G. H. Belding, Calmar, Iowa.

All dentists in Iowa and adjoining states are cordially invited.

WM. H. STEELE, Chairman Ex. Com.

ALUMNI MEETING.

A meeting of the Alumni Association of University of Michigan, will be held at Asbury Park, same time as American Convention, Aug. 6-8, '95. A large attendance is desired.

L. L. BARBER, Secretary.

DELTA SIGMA DELTA FRATERNITY.



R. B. TULLER.

THE Supreme Chapter of Delta Sigma Fraternity held its annual session at Detroit, Mich., Monday, June 17th, 1895. It was the largest attended and most successful meeting ever held. The following were admitted to membership: Dr. T. S. Hacker, Indianapolis; Dr. J. Ward House, Grand Rap-



J. G. REID.

ids; Dr. G. H. Wilson, Cleveland; and Dr. H. C. Raymond, Detroit. Officers elected for the ensuing year are: R. B. Tuller, S. G. M.; J. G. Reid, S. W. M.; A. H. Peck, S. S.; P. J. Kester, S. T.

AMERICAN DENTAL ASSOCIATION.

THE 35th annual meeting of the American Dental Association will be held at Asbury Park, N. J., commencing Tuesday, August 6, 1895, and continuing for four days.

Railroad rates. A rate of *a fare and one-third for the round trip* upon the "certificate plan," has been secured. In order to get this reduction, full fare must be paid in going to the meeting, a *receipt* being obtained therefore from the ticket agent at the *starting point*. If traveling over more than one line, secure a certificate over each line, or have the ticket agent at the starting point name in the receipt the different roads over which the ticket is good. This receipt (certificate), must be countersigned by the Secretary of the Association, and entitles the holder to return for one-third fare. Arrangements have been made to have the joint agent of the railroads present at Asbury Park on Wednesday, August 7, and it is desirable, that all who intend to attend the meeting, shall be in attendance, so that their railroad certificates can be passed upon at that time. No rates have been granted over the lines comprised in the Western Passenger Association. Members residing west of Chicago should secure the best rates

they can to the point, where they enter the territory in which the reduced rate prevails.

J. N. CROUSE,
Chairman Exec. Com., 2231, Prairie Ave., Chicago.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE annual meeting of this body will be held at Asbury Park, N. J., on Saturday, August 3, at 10 o'clock, A. M. It is very desirable that all the colleges having membership be promptly present at that hour, as most important business will be before the Association, and the time allotted is usually short for the work to be done.

The Executive Committee of the Association will meet on Friday previous at 10 o'clock at the same place. All business for that committee should, so far as possible be in their hands before the meeting, in order that there be no delay.

J. TAFT, Chairman Ex. Com.

LOUIS OTTOFY, Secretary, Masonic Temple, Chicago.

AMERICAN DENTAL ASSOCIATION.

THE thirty-fifth annual session of the American Dental Association will be held at Asbury Park, New Jersey, Aug. 6, 1895.

GEO. H. CUSHING, Rec. Sec'y.

COMMENCEMENT.

THE fifty-first annual commencement of the Dental Department of the University of Michigan, was held on Thursday, June 27th, 1895. The D.D.S. degree was conferred upon 45 candidates and the degree of D. D. Sc., on two candidates.

AT the annual commencement of the Dental Department University of Pennsylvania, the degree of D.D.S., was conferred upon 70 candidates. Total number of matriculates for the session 278.

THE OHIO DENTAL JOURNAL.

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SEPTEMBER, 1895.

No. 9.

CONTRIBUTIONS.

WHAT A DENTIST SAW IN EXAMINING 500 CRANIA.*

BY M. H. FLETCHER, M.G., M.D., D.D.S., CINCINNATI, O.

In presenting this subject according to the program, it is not my intention to go into detail of any of the pathological conditions of the tissues of the mouth, but to offer to you a few facts which have impressed me during the little work I have done in examining crania.

This work was begun with special reference to the study of the antrum of Highmore, and for the purpose of determining, if possible, what relation the tooth might have to the diseases of that cavity; since it is claimed by all the authors familiar to me (excepting Dr. E. S. Talbot) that antral trouble comes more largely from the teeth than from any other source. In the examination of five hundred crania, making one thousand antra, my conclusions were that the teeth were as often, and probably much oftener, made pulpless or otherwise pathologically affected by diseases of the antrum, than the reverse; the reasons for which were set forth in a paper read before the American Medical Association, two years ago at Milwaukee, to which I refer you. In pursuing these examinations I found it difficult to confine myself

* Read before the Mississippi Valley Dental Society, April, 1895.

The editor and publishers are not responsible for the views of authors of papers published in the OHIO DENTAL JOURNAL, nor for any claims that may be made by them.

strictly to the points in question, because of so great a number of most interesting conditions which presented themselves for a dentist's observation. In fact, the title of this paper could as properly be, "*What a Dentist did not see*," in the examination of five hundred crania, as what he did see. It was most exasperating to find such numbers of interesting conditions, both pathological and normal, realizing that the time at command was not sufficient to accurately pursue even one subject; an experience corroborated by Dr. E. G. Betty.

In pursuing such work, I was particularly struck, as others have been, with the fact that a very large per cent., or in truth, almost every lesion which a dentist is called upon to treat, leaves its mark in some way on the hard tissues of the jaws or the teeth. I will mention most of them, and ask you if I am not right. Of course all the normal conditions of the hard tissues and their histology can be studied.

In pathological conditions you may study:

Faulty development or osseous deformities of the head, jaws, and teeth.

Certain features of the development of the hard tissues; tumors of bone, necrosis, and caries.

Faulty development of the teeth in enamel; in dentine or cementum; malformed teeth either permanent or temporary.

Irregularities of teeth as to position.

United teeth.

Fused teeth.

Supernumerary teeth.

Supplemental teeth.

Nodular.

Tumors of teeth.

Syphilitic teeth.

Calcic deposits of all varieties.

The effects of calcic deposits upon the bone, and its effect upon the teeth.

In the teeth themselves you may study:

Caries.

Necrosis.

Abrasion.

Erosion.

Fractures.

Hyper-cementosis.

Exposures of the pulp, indicating pulpitis in all its forms.

All forms of new growths of the pulp chamber.

In the diseases of the alveolar process :

Alveolar abscess.

Necrosis and exfoliation.

Absorption or phagedenic affections.

Hypertrophy.

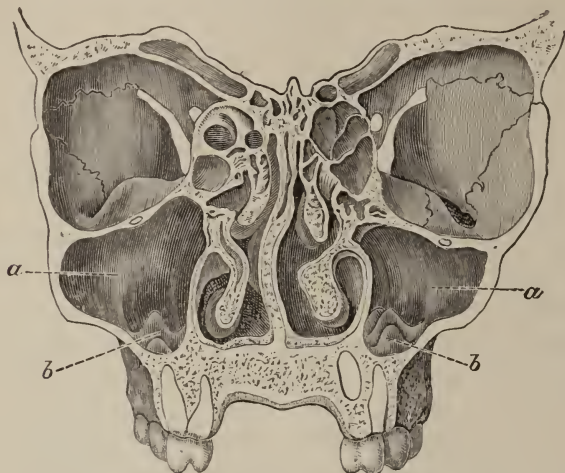
Diseases of the antrum, and the relation they may or may not have had to the teeth.

These and many other points of practical interest to the stomatologist may be studied with great advantage by the examination of crania.

You may say there is nothing new about this; that we all knew it before, and that it has been gone over by the Examination Committee of the American Dental Association, by Dr. E. G. Betty and others, and the results have been published, most of which is true, I admit. But who have been the greatest gainers by those examinations? Those who have done the work without doubt, for *they* have come in direct contact with the objects and phenomena, and received the greatest benefit thereby.

There are important features to be observed, however, which I have not yet seen published. *One for instance*, is that the dental follicles holding the crowns of the superior molar teeth (in normally shaped antra) are usually formed at the expense of that cavity, each follicle being covered with a dome of bone which protrudes into the floor of the antrum while the tooth is being formed and pushed into the mouth; this dome flattens out and entirely disappears by the time the tooth is completed, excepting in rare cases; and it seems a perfectly natural result, when we remember that the alveolar process is only formed after the eruption of the teeth; its position and shape being entirely governed by the position and shape of the teeth; there is then, no other place where the crowns can find space enough for their development, but the one mentioned at the expense of the antrum. The finding of some of these domes in the floor of the antrum in connection with some bony processes, may account for the description by anatomists, to the effect that the roots of the molar teeth protrude into the floor of this cavity, and are either bare or covered with bone, forming numerous bony tubercles corresponding to the

apices of the sockets of the teeth. Other authors taking these as authority have perpetuated this statement until it seems the prevailing opinion that this is the normal condition.

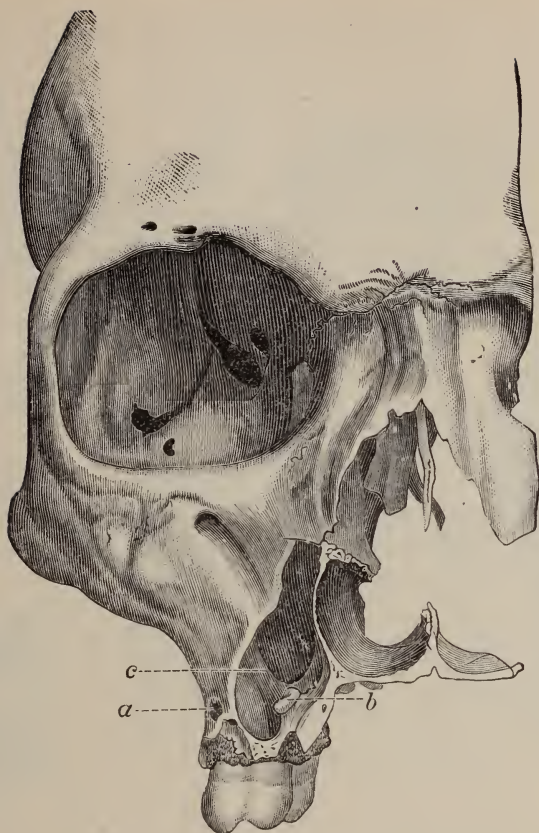


No. 1.—From Zuckerkandle.

Zuckerkandle pictures these in a normal skull (see cut No. 1, b) and most works on anatomy, which I have seen, speak of it as being the normal condition. Gray, Leidy, Quain, Holden and others do so. In fact, I have seen no exception to this description in any work on anatomy; but over one thousand antra, according to my examinations, show it only five times, and one of these specimens I pass about for your inspection. (See No. 2.)

As to another point, I quote the following from Dr. Bödecker's late work on "Anatomy and Pathology of the Teeth." He says: "The apices of the roots of the second bicuspid and the buccal roots of the molars are in contact with the floor of the antrum." This is given without exception or qualification. An examination of a few sections through the alveolar process and into the antrum of this region, will, I think, show this to be the exception rather than the rule, since these specimens (Nos. 3 and 4) are more common, according to my own observation, and I believe it to be normal. The apices of the roots of the molars do sometimes come in contact and often perforate the floor of the antrum as shown in specimens (Nos. 3 and 4), but I find this condition the exception rather than the rule.

As to the second bicuspid, I have very seldom seen it in con-

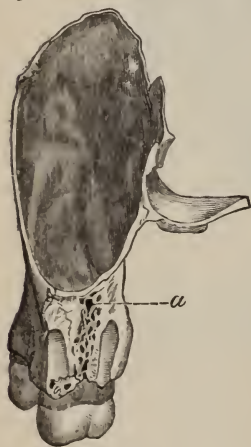


No. 2.

tact, or even pointing directly toward the floor of the antrum, (see specimens No. 3), and a drill taking the direction of the axis of the tooth, would most likely run a quarter or half inch before reaching even the anterior wall of the cavity, and just as likely miss it all together, and in some cases would reach the floor of the nose.

These may seem like minor, or unimportant points, but since we must have the anatomy and osteology of these parts described, for the benefit of those who are likely to deal with pathological conditions in this region, the description had better be right than wrong, and dentists, or rather stomatologists, had just as well have the credit of doing it right as any other set of men; hence, the necessity of investigating and discussing the subject. I have

never seen a description of these features in any text book based on a series of examinations, but have seen such statements as referred to, over and over again, and made without exception or qualification. The following, as an example, is copied from Gray's last edition; describing the antrum or maxillary sinus. He says: "Projecting into the floor are several conical processes, corresponding to the roots of the first and second molar teeth; in some cases the floor is perforated by the teeth in this situation;" and he quotes Mr. Salter on "Abscess of the Antrum," as authority. If the points referred to above, are of sufficient moment, and



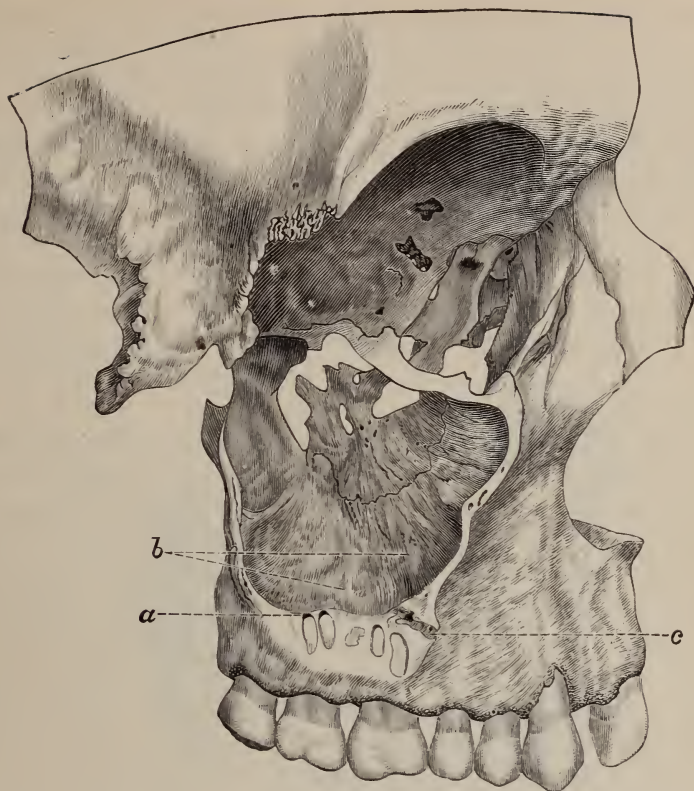
No. 4.



No. 4.

need correction, let us present adequate proof, and have the correction made, if the statements herein made are based on error; then I shall be exceedingly glad to be corrected.

Another fact of great interest to me was, that showing an almost total absence of dental lesions of any character in the mouths of Northern Indians and Esquimaux. In forty-eight Alaska Indians, only two abscessed teeth were found, and these teeth seem to have been broken rather than decayed. In thirteen Esquimaux no abscesses and no decay was found in the whole *sixty-one* skulls. There were exceedingly few with calcarious deposits upon the teeth; and no cases where the teeth had apparently been lost from this deposit and its consequent results. The cases of abscess in these tribes show about 3 per cent.; whereas, the number of abscessed teeth in the Mississippi Valley Indians proved to be about 30 per cent. These were all upper molars;

N^o. 3.

but the comparative per cents would probably remain about the same if all abscesses had been counted.

The loss of teeth from tartar and its consequences in the Mississippi Valley Indians was simply enormous. Having taken no statistics on this point, I cannot give numbers and per cents, but speaking from memory, I should say, that the loss from tartar in the Mississippi Valley tribes must have been found in 33 per cent. of cases. Great quantities of tartar still clinging to many of the teeth, and numbers of skulls, showed unquestionable evidence of the teeth having been partially, and in many instances totally lost from phagadenic diseases; which, doubtless, were brought about by excessive accumulations about the teeth.

These facts are significant for the reason that the food of the two classes, or nations, were so different; the northern tribes

living almost entirely upon meats and oils, which are free from grit, and need but little mastication; while the tribes living in temperate or torrid zones, lived more largely upon vegetable diet, containing more or less grit, then vegetable substances usually need more mastication than meat before they can be swallowed. If I tried to account for the difference in quality of structure, or loss of teeth in these people of such different habits, it would be after the above manner, and that after long lapses of time heredity would cut quite a feature, for no doubt generation after generation of these tribes lived under the same environments.

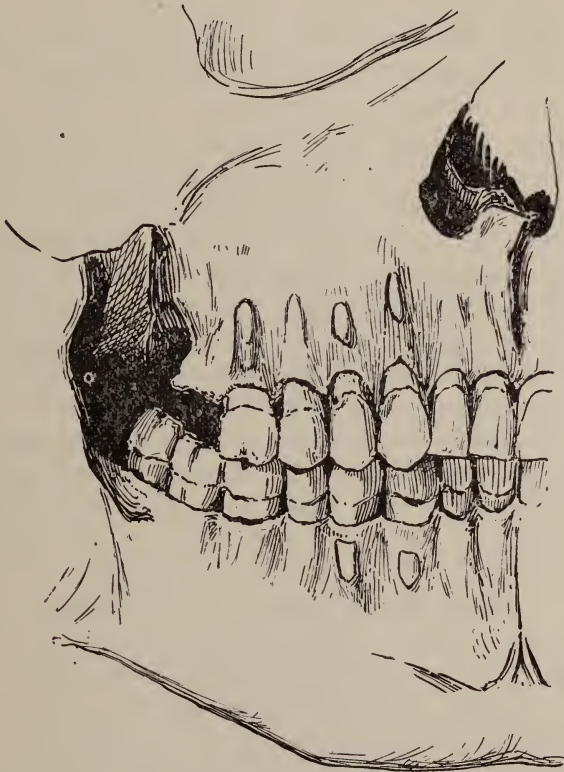
The chemical difference between animal and vegetable foods may cut some figure, but I believe the mechanical feature is primarily the greater factor.

As to diseases of the antrum, it seems to me that these people were remarkably exempt, when we consider that they could have had no surgical or medical attention; and also that about 25 per cent. of them had abscessed upper molars. This fact is significant, too, when it is claimed by the majority, and in fact nearly all authors, that disease of the antrum comes more largely from this class of teeth than any other source. This series of examinations show that out of the 252 cases of abscesses of upper molars, only 12 perforated the antrum. This would seem a remarkably small number and count as a point in favor of claiming that abscessed teeth do not cause antral trouble as often as most authors claim they do, in comparison with other causes of inflammation of this cavity.

My reasons for believing that the teeth are, and may often be affected by diseases of the antrum, are strengthened by considering a certain feature of the anatomy of the parts, mentioned by Gray, and omitted by most other anatomists, namely, that "In some cases the floor is perforated by the teeth in this situation." I found this to be the fact in twenty cases, showing that about 4 per cent. of persons have normally nothing covering the apices of these teeth but mucous membrane or soft tissues; I here would say, that the statistics on this particular point *are not accurate*, on account of the inability to see into the antrum in an unbroken skull. Many skulls were broken, however, so that examinations could be thoroughly made on this point, as well as others; and when they were not broken, the sense of touch was used to determine the presence of bony processes, septa and the

general form of the cavity; and the normal openings above the teeth as far as possible.

It was also observed that the normal openings occurred where the floor of the antrum was comparatively flat, and not where there was a conical process (see Nos. 3 and 4), and that those cases where the conical process occurred were almost invariably covered with a considerable thickness of bone (see No. 2).



No. 5.

These conditions being present, it would seem a natural result, when the mucous membrane of the floor of the antrum becomes broken down, for the blood and nerve supply of teeth so perforating the floor, to be interfered with, and possibly entirely destroyed, since the apical foramen of the teeth must be exposed to these destructive influences. In cases of occlusion of the osteum-maxillare and other openings into the nose, the antrum may become tensely engorged; and under this condition, if there

be no bony covering to the apex of a tooth, it would of course be more or less driven from its socket and become very sore to the touch, or occlusion with its antagonist; under such conditions I can imagine the teeth having been blamed for the trouble, since it, or they, would be exceedingly tender on percussion, and one under these circumstances would be most apt to say, there is your exciting cause in that tooth.

It is my belief that if accurate statistics could be had, they would indicate that the exciting causes of diseases of the antrum would show, say 10 to 1 in favor of intranasal disorders. I make this statement, taking into consideration the larger per cent. of teeth that are known to perforate the bony floor of the antrum, for my observations also show that a much larger number of teeth are denuded of bone, on the buccal surface of the alveolus (see specimen No. 5), hence the large preponderance of abscessed teeth which discharge in this locality, a place where one familiar with the disease invariably looks for a fistulous opening. In this situation, if the bone is not entirely absent in some spot, it is so thin that it offers to internal pressure the least possible resistance of any other part of the sockets of the teeth.

Other points of much interest to us as specialists could be considered, but since I took no accurate figures on them, I will defer their discussion until closer and more careful observations can be made.

TRI-STATE DENTAL MEETING.

(Continued from page 405.)

RHIZODONTROPY.*

BY S. B. BROWN, FORT WAYNE, IND.

AFTER paying tribute to the dental profession of the present and past, and referring to the discovery of this method of operating by Dr. Hullihen, he describes the original process thus:

"Just fifty years ago, Dr. S. P. Hullihen, an eminent dentist, of Wheeling, discovered an operation for the surgical treatment of dental pulps, which he denominated *Rhizodontropy*; a description of the operation being to drill through the gum and alveoli, a line within the margin of the latter, into the pulp canal.

*Abstract of the paper read

This unique operation was for exposed or congested pulps, either previous or subsequent to the operation of filling.

In cases where life remained, the practice was to give vent only, wounding the pulp as slightly as possible; aiming to preserve its vitality—the gum acting as a valve for its further protection. The drill was usually driven with a bow and slack cord."

Regarding a modification of this method, Dr. Brown said: "The early professional life of the writer was contemporary with the later one of Dr. Hullihen, and the operation which bore his name, was employed until pulp extirpation and root filling supplanted it.

In the treatment of deciduous teeth, with pulpy complications, the operation of rhizodontology, with modifications, was several years since re-adopted, with more satisfactory results than with other treatment.

The *modus operandi* consists in thoroughly removing pulp tissue, or its *debris*, when exposed, when the cervix is perforated on the mesio-buccal surface, one sixteenth of an inch within the gingival border and terminating at the floor of the pulp chamber; the cavity being prepared, a disc of lead, properly adapted, is placed on the cavity floor, to prevent obstruction to the vent which the perforation affords—when filling completes the work.

Thus treated, the organ of resorption performs its natural function, without interruption and childhood is dentally blessed to the limit of nature's plan.

In the treatment of pulpitis, in permanent teeth, where extreme inflammation prevails, the practice of rhizodontology can be employed to great advantage over the method of drilling through crowns or fillings, as with it the minimum of vibration results.

As we stand upon the brink of another century, contemplating its needs and possibilities, let us hope that future dental historians may profitably wipe the dust from our record in this the closing decade of the nineteenth century.

Plates, of which the accompanying miniature illustration is a representation, will be shown to elucidate the subject. Also deciduous teeth, which have been treated as described, and years subsequent, normally shed, will be shown in proof of the efficacy of Rhizodontology."

GENERATION AND DEGENERATION OF THE
TISSUES OF THE MOUTH.*

BY W. H. WHITSLAR, M.D., D.D.S., CLENELAND, O.

THE first general observation we should perceive in the study of vital phenomena, is the mutual dependence of all things, which in their groupings together, compose the system of nature. This dependence requires for each being the existence of all the others.

Physiological science may rest upon truths of its own, but these are enriched by facts furnished to it by collateral sciences. Anatomy is a part and parcel of physiology, and, of all studies, it enables us to obtain the best appreciation of the beauties of living phenomena. It is essential to understand the situation, size, form and structure of organs, and their relations, in order to have a perfect conception of their functions.

Now, the phenomena of development, growth, sensation, decay and death, and many others, belong to life. Life occurs only in material structures which exist in obedience to the laws of physics and chemistry, and is a superstructure upon these laws, which cannot be studied independently of them. Indeed, the greater part of the phenomena of organic beings is chemical and physical, modified only by an additional principle called life.

Life is at first composed of a small number of phenomena, under whose guidance various organs are developed, and properties which characterize life become more and more prominent, increasing in energy and power.

Man's life is inseparably linked with the plants and animals, and his existence depends upon the climate and productions of the earth. His own organic constitution participates in all things that surround him, hence it is necessary, in order to understand the conditions of our existence, to begin at the germ of organization and pursue the changes that occur in the nearest approximation to the inorganic material of the universe. We should study the protozoa, and rise in the scale until we arrive at the height of God's perfected being—man. In this study we would find the mutual dependence of all living organisms, and the expanse of

*Abstract of the paper read.

power widening as the scale of organization ascends, each being independent in propagation of species. Whilst there is a vital power given to each organism in the first place by the Creator, there is a correlated physical and chemical relationship thereafter between individuals, in accordance with their environments. Recognizing the dependence of man upon his surroundings and his predecessors, in a measure, his individualism is born when the pronucleus of the ovum is impregnated with the spermatozoon.

If the theory of Weissman be true, then in this microscopic cell there exists germ plasm that has been transmitted, or a continuity is established that carries with it the natural impress of parental characteristics. In this way heredity forms an active agent in the generation of all parts of the economy, and it is an important etiological factor in pathogeny.

So, beginning with the cell, or egg, its first aptitude is its adaptation to its environments, and in the hope of the establishment of an equilibrium between itself and parent, it extracts from its trysting place pabulum until it is expelled from the body. The equilibrium between parent and embryo is not recognized until the child is entirely independent, and a personal existence commences.

To be specific, we must particularize. Every animal arises from an egg, *i. e.*, an impregnated cell from the female. The union of this protoplasmic material involves chemical and physical phenomena, and, endowed with united vital forces, organization is promoted. These chemical changes increase in proportion to the growth. Indeed, the cell is the simplest physiological apparatus, and as such is the seat of chemical processes. It is generally conceded that all chemical changes of importance do not take place in the animal fluids, but that these occur in the cells. The cells regulate by their activities the chemical processes and exchange of foods.

In the generating of the tissues of the mouth from the primitive cell, the process of segmentation evolves the ectoderm and entoderm, from which springs the mesoderm. Just why these layers of cells, which are seemingly evolved from the same material, should mature different tissues is difficult to understand. All we can say is that there is a different chemical and physical arrangement of the molecules of matter, presided over by existing vital forces.

That vital phenomena have to do with the chemical arrangement of bodies, is exemplified by the experiments of Mr. Rainey, in the processes of calcification. In the formation of enamel or dentine, calcific material is held in chemical combination with the intercellular substances in the vicinity of, and in the enamel organ and dentinal papilla. By the action of ameloblasts and odontoblasts—specialized cells—enamel and dentine are formed. It is by their activities that the lime is deposited chemically as well as physically.

An aggregation of cells composes what is termed the enamel organ, and it is said that the function of the enamel organ is the formation of enamel. Strictly speaking, however, it is a matrix to mould the form of the tooth, the performance of function being resident in the ameloblasts.

Function is a vital phenomenon; and pathological conditions are perverted physiological phenomena. The difference between these two conditions is an indefinite line wherein the balance of vitality is overcome by perverted function. If tissues are degenerated from their normal tendencies, regeneration balances the waste, but if they are normal it is a physiological process. If, however, the cell destruction is greater than the cell production, regeneration is suspended and atrophy results. Thus we observe that the degree of atrophy is proportionate to the diminution of function.

Now we find frequently that teeth have white and brown spots that are congenital. These spots are the result of perverted function of the cells that superintend the deposition of the lime salts. This perversion is ostensibly caused by starvation or improper metabolism of foods. It would not be entirely amiss to surmise that the white spots were produced by increased function, but limited in the supply of organic materials. In these we find the intermediary organic substance is deficient. The colored spots contain a greater amount of organic matter than the white spots. This may be due to the sluggishness of circulating fluids in the vicinage, resulting in stagnation or lessening of the chemical and physical processes. Thus, while other parts of the tooth are developing, an area of imperfect tooth material is constructed, which is due to the lack of power of the cells which have to do with the building, so to speak. There is a failure of correlation of the organic and inorganic substances, and the tooth becomes more of an admixture than a proper organization.

Notwithstanding criticisms to the contrary, I believe that hæmoglobin and oxyhæmoglobin of the blood and their derivatives, hæmochromogen, hæmatin and methæmoglobin, acting as transudation products, or even the results of decompositions, stain these areas by being incorporated with the material.

It is to be remembered that the blood vessels are in close proximity to the ameloblasts, also that these cells are derived from the malpighian layer of cells, which have to do with the pigmentation of the mucous membrane. There is in this a close analogy which may be significant. However, we must rely upon the activities of the blood in the vicinity, for it is the first tissue to exhibit extreme atropic changes.

It is necessary to have blood present after the first stages of calcification to further that process. During these preliminary stages the mineral elements may be found in proximity to the developing tooth, and from these the primary deposits may be accrued.

The mineral substances are the most essential constituents of the teeth. Phosphate of lime is greater in amount in the teeth than any other tissue. The consumption of it during pregnancy is often so great that it does not appear in the usual amounts in the excreta, scarcely any trace being found (Lehman). This may account in part for Lehman's declaration that lime salts are deposited mechanically in bones. He gives as proof, the ease with which lime salts can be so thoroughly dissolved from bones by hydrochloric acid. Acting upon this hypothesis, may we ask the question, "Are enamel and dentine deposited mechanically?" This is partially true, I believe, for, as already stated, there is resident material in the part, as well as that which is carried to it by blood and intercellular fluids. This may be a process of osmosis, or it may be one of catalysis. We learn that 'earthy phosphates are found in all cells and tissues. Indeed, they seem to be of greatest importance for the life of the cells and the chemical processes that accompany their evolution; that it is impossible to separate them from the protein substances without decomposition. There is no animal tissue which does not contain mineral substances.' 'The bones, teeth and muscles contain the most minerals.' In the distribution of mineral substances, we find them dissolved in the fluids and partly combined with organic substances."

The question naturally arises, are mineral substances manufactured within the body? It is established that on the burning of the organic substances the mineral bodies are liberated and eliminated. They, in part, combine with new products of the oxidation and become attached to the organic bodies which are free from salts, and are absorbed from the intestinal canal.

Hence, it would be seen that a constant supply of mineral substances is not absolutely necessary, and that an insignificant amount of inorganic bodies must be administered.

So I wish to argue that, for this scientific reason alone, it is not a necessity to administer constantly foods bearing large quantities of phosphatic materials to develop good teeth. We must rely upon the resiliency of life as the energizing power to create metabolism. Physical forces strive to maintain themselves in equilibrium—thus we have metabolic power. A point of rest, normal state of being, is attained because physical forces act upon matter even if it has attained its equilibrium. Inorganic chemistry also induces motion, and continues active in motion and metamorphoses until the closest affinities are satisfied. Albinus established the axiom that the essence of vital force consisted in motion. But if that vital power is by disease deficient, then the metabolism of materials into tooth structure is obstructed, and we see the results in deformed teeth, both as to form and structure.

Let us, for example, suppose that fever disturbs the parturient woman, she is robbed of nutritive power to supply her embryo. Unfortunately nature does not come to the rescue, and, the equilibrium being unbalanced, she is sacrificed at the expense of her general health, and the embryo develops, but less actively. Because of this sacrifice, we seldom witness defective deciduous teeth, and unless the parent recuperates, the disease shows its tracings upon the permanent teeth; in other words, produces a disease destroying the pivotal anchorage upon which the balance of vital phenomena is supported.

Rachitis and concomitant diseases, affecting particularly the bony structures, are resultant from imperfect metabolism and starvation. The mineral substances leave the body uninterruptedly in starvation, until death (Hammarsten). The experiments of Chossat and Voit show the loss of weight of bones during starvation to be as high as 17 per cent. in pigeons and 14 per cent.

in cats. Blood and its solid ingredients decrease in proportion to the weight of the body. Naturally, then, the teeth, whose development is dependent upon blood, must suffer.

It is not necessarily sufficient to argue that the teeth suffer in the same proportion as bones, because one system of organs may derive its nutriment at the expense of another organ, so it is impossible to say that teeth receive their aid from this or that. They do suffer, however, and all the permanent teeth developing whilst in utero show at times marked signs of starvation. The cells, which are the constructive agents of the teeth, may have such environments that the resiliency of their activity is sufficient to controvert the disease; their chemical and physical activities are alert, and extract from other tissues material for a continuance of construction. This seems to be a gift of specialized cells.

Phosphate of lime is an important adjunct in metamorphosis of animal tissues. We receive much of it through our food. The graminivorous animal receives it through the vegetable kingdom, in certain nitrogenous bodies which contain phosphate of lime, as in vegetable albumin, leguin and gluten. Phosphate of lime is not removed from the body until it is partially decomposed or oxidized, and in this process phosphoric acid must accrue, which enters into union with the lime that enters the body with cereals and leguminous plants. Hence, we observe the relation of our bodies to all that surrounds us, as stated in the beginning of this paper. Our body is a great chemical laboratory, in which wonderful phenomena are exhibited.

Developing tissues of the mouth have great reliance upon chemism, and improper construction may be due to the disassociation of molecules of matter; all these being modified by the principle of life.

AMERICAN MEDICAL ASSOCIATION.

DENTAL SECTION.

(Continued from page 413.)

CALCIFICATION OF THE TEETH.*

BY R. R. ANDREWS, CAMBRIDGE, MASS.

CALCIFICATION has always been a difficult subject, and authorities have been at sea concerning the finer processes which nature takes to fashion the fully calcified substance. Calcification is a process by which organic tissues become hardened by a deposition of salts of lime within their substance. In the intercellular tissue, and in the substance of the cells themselves, these salts are deposited by the rich blood supply always near. They are deposited in minute particles and in such fine subdivisions that it makes it difficult to demonstrate many of them even with the higher powers of the microscope.

The intercellular substance, either a protoplasmic or gelatinous fluid or semi-fluid, contains the lime particles. In it they change their chemical nature, uniting with the organic substance of the part and form small globular bodies which have been called calco-spherites; and these blending or coalescing into a mass form a substance called calco-globulin. This calco-globulin, which is a lifeless matter, has been deposited through the cells into a gelatinous substance, and in some cases into the substance of the cells themselves, where by a further hardening process, it becomes the fully calcified matrix.

If a soluble salt of lime be slowly mixed with another solution capable of precipitating the lime, the resultant lime salt will go down as an amorphous powder, and sometimes as minute crystals. But when the lime salts are precipitated in gelatin or albumen, the character of the lime salts is materially altered. Instead of a powder there were found various curious but definite forms, quite unlike the character of crystals or powder produced without the intervention of the organic substance.

Mr. Rainey found that if carbonate of lime be slowly formed in a thick solution of albumen, the resultant salt has changed its

*Abstract of the paper read.

character. It is now in the form of globules, laminated like tiny onions. These globules when brought in contact with one another become agglomerated into a single laminated mass, it appearing as if the laminæ in immediate apposition had blended with one another. The globular masses at one time of mulberry-like form, lose the individuality of their constituent smaller globules and become smooted down into a single mass, or layer, and Mr. Rainey suggests as an explanation of the laminated structure, that the smaller masses have accumulated in concentric layers, which have subsequently coalesced; and in the substitution of the globular for the amorphous or crystalline form in the salt of lime, when in contact with organic substances, Mr. Rainey claims to find the clue for the explanation for the development of shells, teeth, and bone.

At a more recent date Prof. Harting took up this line of investigation and found that other salts of lime would behave in a similar manner, and that by modifying the condition of the experiment, very various forms might be produced. The most important addition, to our knowledge, made by Prof. Harting, lay in the very peculiar constitution of the "calco-spherite," by which name he designated the globular forms seen and described by Rainey. That these are built up of concentric laminæ, like an onion, has already been stated, and Mr. Rainey was aware that albumen actually entered into the composition of the globule, since it retained its form even after the application of acid. But Prof. Harting has shown that the albumen left behind, after treatment of a calco-spherite with acid, is no longer ordinary albumen; it is profoundly modified, and is become exceedingly resistant to the action of acids, alkalies and boiling water. For this modified albumen, he proposes the name calco-globulin, as it appears that the lime is held in some sort of chemical combination, for the last traces of lime are retained very obstinately when calco-globulin is submitted to the action of acids.

Now, it is a remarkable fact, that microscopic glistening specks and globules are constantly seen at the edges of tissue where enamel, cementum, dentine or bone are to be formed, or are forming. These microscopic, globular bodies, have been called calco-spherites, and it appears as though some such process as described by Prof. Harting is transpiring within the substance of the tissues where bone, dentine or enamel is to be formed. It

will be noticed that near this point of formation there is always to be found a rich, capillary blood supply, and from this the lime salts are given out. The abundant appearance of these microscopic glistening globules, referred to above, at the time of the formation of the enamel, and their entire absence at earlier stages, is to me an indication that the globules are an enamel substance, the matrix forming calcospherites; and following up their future confirms this.

The growth of the enamel, once begun, takes place by addition of these globules. I am convinced that the larger ones are composed of hundreds of the smaller ones, which have coalesced into the main mass. When enamel is commencing its process of calcification, if we examine carefully with high powers, we shall find in that slight amount of the enamel organ that is directly over the calcified point of dentine, in what remains of the stellate reticulum and in the stratum intermedium principally, a very large number of glistening points. They are the forming calcospherites, or rather, they are the minute particles of lime from the blood supply; changing their chemical nature as they pass into the protoplasmic juices of the part. These appear to be passing into the formative cells, and these cells superintend their formation into enamel rods—that is, they are laid from the cell against the forming rod. Within the substance of the ameloblasts they are seen to be growing larger by the smaller ones coalescing with others. If, at this point of their development, the layer of enamel cells is pulled away from the cap of the formed dentine, we shall see that the cap of dentine is everywhere covered with quite regularly formed granular bodies. If, on the other hand, the layer of enamel cells is against the formed cap of dentine, the masses are assuming block-like forms, as though taking the form of the future enamel rod. They appear to be in a gelatinous substance, which is between the dentine and the enamel cells, and here, by an unknown chemical process, they become the hardened columns of the enamel.

In dentine the calcifying process goes on in much the same manner. The odontoblasts are merely masses of protoplasm and appear to have no membrane; as is the case with the ameloblast, it has a nucleus at a point farthest from the calcifying matrix. In forming the odontoblast, or pulp tissue through the odontoblast, gives out a rich gelatinous substance about as wide as the

larger of odontoblast cells. Everywhere, between the odontoblasts is found a rich supply of connective tissue cells, whose function appears to be the forming of a network of connective tissue fibres into this gelatinous substance; this network seeming to be a scaffolding upon which the calco spherites, which are to form calco-globulin, are to be deposited. Into this layer the odontoblasts are also superintending the placing of the minute globules which are within them, and which have been given to them the rich blood-supply found everywhere near their pulp ends. Into the calcified substance the globules form against the calcified matrix, where, fusing with others, they form a mass, entirely filling the gelatinous substance. This gelatinous substance, with its mass of globules, now becomes calco-globulin. By some natural hardening process it then becomes calcified matrix, and thus another layer of calcified matrix is formed.

In the cementum, a tissue I have not studied as carefully as I have the others, I am convinced that the calcifying process is much the same. The first cemental calcification takes place by the cementoblasts giving off these globular bodies near the neck of the tooth against the forming dentine of the root, into a gelatinous substance, this also being given off by the cells. It assumes the form of plates or scales; afterwards the cells themselves appear to fill with the globules and lose their identity in the forming matrix. That peculiar tissue which we call "tissue on the borderland of calcification" is composed of globular glistening bodies which have coalesced and formed a layer within a gelatinous substance previously given out by the formative cells. In this condition it is a tissue indestructable both in acids and in caustic alkalies and only in this condition is it true calco-globulin. The conclusions here given on the subject of calcification are arrived after many years of original investigation. They are, I believe, with slight modification, accepted by most of the more recent authorities. I shall now review very briefly some of the, to me, erroneous views presented in a recent work. I refer to a work entitled "The Anatomy and Pathology of the Teeth." The author, and his associates, in a chapter describing "The Calcification of the Enamel," make these statements:

"The more we turn to the centre of the cup [enamel organ] the more shall we be struck by the presence of glistening, homogeneous lumps in the epithelia, until we have reached the centre

of the cup where we observe that epithelium* has been transformed into a number of such lumps in a regular arrangement, which reminds us of their origin from previous epithelia. The original epithelia [enamel cells] gradually become enlarged and are at last split up into a number of medullary corpuscles." Again, "medullary tissue develops into connective tissue of a decidedly fibrous character."

Again: "There is good reason for the assumption that the medullary tissue sprung from the previous external epithelium [of enamel organ] is the source for the completion of such enamel as we observe upon temporary teeth when they emerge from their sockets."

Again: "If we examine the lower edge of the cup of the enamel organ at about the sixteenth week of embryonal life, we observe a peculiar change in the columnar bodies of the internal epithelium, which consists in the appearance in a more or less row-like arrangement, of highly-glistening globular bodies, replacing the previous columnar epithelia. These bodies are either solid or slightly vacuolated, and *are formations of living matter*, such as we are accustomed to look upon as medullary, embryonal, or indifferent corpuscles, in their earliest stages of appearance. Obviously these glistening globules have originated from the reticulum of living matter of the columnar epithelia [enamel cells] themselves. We feel justified in this conclusion from the fact that we can trace, step by step, the growth of these glistening granules up to the formation of glistening lumps, such as we have termed medullary corpuscles. . . . The lumps are extremely glossy, with a high degree of refraction. They are arranged at first irregularly in a layer of considerable breadth, and higher up in rows, and by their coalescence and prolongation give rise to small columns of the ameloblasts. . . . These [medullary] corpuscles, or the liquids, contained in their reticulum, become solidified into basis substance and immediately infiltrated with lime salts. . . . The enamel rods are built up in rows of such calcified or petrified medullary corpuscles."

These observations in regard to the calcification of the dentine endeavor to show that the odontoblasts are split up at their distal ends into these glistening bodies, which they call medullary corpuscles.

"These medullary corpuscles are lumps of protoplasm, in

which living matter is stored up in different shapes, the glistening globules of small size having arisen from protoplasm, and that these represent a juvenile condition of living matter in its most compact aggregation which enter directly into the formation of the basis substance of dentine, while at the same time, continually super-added to the proximal ends of the odontoblasts are the medullary corpuscles derived from the living matter of the papilla. The continuity of the odontoblasts in dentine is established."

"They assert a similar proceeding from ameloblasts, in a reverse direction. Thus, the ameloblasts being broken up at their proximal [dentine] ends into medullary corpuscles, which are directly transformed into blocks of enamel rods, and super-added to at their distal or perispherical ends by medullary corpuscles derived from the stratum intermedium." . . .

"The indifferent corpuscles serving to supply additions to the ameloblasts, exhibit all intermediate stages between small, globular, glossy and compact nucleated, protoplasmic lumps. . . . "Nothing but a transmutation of solid, globular lumps of living matter in delicately reticulated medullary corpuscles seem to be required for the building up of the minute blocks of the enamel rods without the intermediate stage of ameloblasts. . . . The first appearing enamel is made up of irregular, angular, glistening lumps, greatly varying in size."

In these few selections from a chapter in this book on "Calcification," I have given some of the points which they present; and these I propose to briefly review. No one can be more clearly aware of the patient and persistent effort, and of the immense amount of labor and earnest research which the author has given to his work, than myself, and great credit from his profession is due to Dr. Bödecker for this labor. I am not in accord with his views as to calcification of the dental tissues. To some of us "the reticulum" and the "medullary corpuscles" are bug-bears. To the earnest investigator, who did not know the author, it would seem from their description of the calcifying processes, as if a tissue had been built up to fit a theory. So far as I am aware, photo-micrographs of these tissues, as described in this chapter on calcification, have never been shown. There is no absolute evidence to prove the correctness of their assertions.

These peculiar theories on the calcifying process cause a very considerable amount of doubt in the mind of any one who has

given this subject attention in the way of original investigation. The theories advanced clash strangely with facts. The glistening bodies seen in the epithelial layers of the enamel organ, are but lifeless lime globules and do not have their origin in a reticulum of living matter in these epithelial layers. Their origin is more probably from the blood supply, which is everywhere abundant near these layers. It is speculating in a very lively manner to assert that the cells in the enamel layers split up into a number of medullary corpuscles of a fibrous character and then become formations of living matter; and it is wholly a hypothetical statement to make when they say that these glistening bodies by coalescing and prolongation, give birth to the ameloblasts. Their lumps of living matter, which they call medullary corpuscles, are but glistening masses of lifeless matter known to be calco-globulin. They are not medullary corpuscles; they do not arise from protoplasm; they are not "a juvenile condition of living matter in its most compact aggregation."

MISSISSIPPI DENTAL ASSOCIATION.

ANNUAL MEETING, 1895.

Reported for OHIO DENTAL JOURNAL by Mrs. J. M. Walker.

(Continued from page 417.)

THE second and third days of the Association were devoted entirely to

CLINICS.

DR. C. L. ALEXANDER, Charlotte, N. C., who had been specially engaged by the Clinical Committee, coming from his distant home at the expense of the Association, to clinic in new and original methods of bridgework, amply fulfilled the anticipations of the Clinic Committee.

He constructed a piece of bridgework, on the first day of the clinics, by an original and novel method, which he terms a *SUSPENSION DENTURE*—a method by which the natural teeth are not subjected to any cutting beyond drilling a hole in the labial surface of the teeth of support for the reception of short screw posts, which pass through corresponding holes in the band of the denture, when it is finally adjusted. In the case in question the

superior left lateral and right central incisors were to be supplied. A narrow band, or "skeleton attachment" was accurately fitted to the lingual surface of the remaining incisors, with arms extending back of the cuspids. On the band a hollow receptacle was constructed, partially filling each vacant space, forming a backing for the porcelain bridgework facings, the long pieces being bent inside the hollow backing, which is then filled with cement, with a facing of amalgam to protect it from the fluids of the mouth. The piece, when finished, is slipped on over the pieces previously inserted in the palatine surface of the teeth of support. Thus the natural teeth are neither cast nor banded, no gold appears at the labial surface, and the piece does not depend on cement for retention.

DR. T. P. HINMAN, Atlanta, Ga., demonstrated his original method of securing accurate adjustment of the Logan crown to the abutment of the root; also an original method of banding the Logan crown, using the screw press of the Hollingsworth contour system, which Dr. Hinman has improved, by making the block of wood used, circular, fitting inside the ring of the press, and by the addition of a swivel on the end of the screw, so that the crown is not twisted round out of proper position in the band. The band having been accurately adjusted to the root, is burned into the block of wood by the Hollingsworth contouring method, a hole reamed in the block to receive the pin of the Logan crown, which is then sent home in the band by the screw press, making a very close fit, without altering the fit of the band to the root, this portion being burned into the wood floor of the press.

Dr. Hinman stated that he is now at work on, and has nearly brought to perfection, a bridge composed entirely of Logan crowns, which will require the minimum amount of gold in construction, having no gold backings, and no gold to show at the labial surface, or cutting edges of the teeth.

DR. WM. CRENSHAW demonstrated "The Bryant Method" of replacing broken porcelain teeth in bridges in the mouth.

DR. J. Y. CRAWFORD demonstrated an original method of restoring broken incisors, with tips ground from porcelain teeth, preferably of English make, because of superior density of body and susceptibility to polish after being ground. The portion selected to form the tip is so ground as to admit of inserting the pins of the porcelain tooth in holes drilled in the dentine or in the

gold of approximal fillings, of the broken tooth. In the case operated on, the central incisor having approximal fillings, gold and tooth was cut off squarely and a lower lateral incisor adjusted transversely, and so inverted as to allow the pins of the tooth to enter the tooth perpendicularly.

At the night session Dr. D. B. McHENRY, Grenada, read a paper on

METALLURGY,

advocating a return to the methods in prosthetic dentistry, which had been so largely abandoned since the introduction of rubber for plate-work. Rubber plates he condemns as "catch-basins" of disease, commending them to John Chinaman or a formidable rival to the historic "stink-pots" as weapons of warfare.

Dr. J. B. ARKEW, ex-President of the Association, read a paper on DENTAL EDUCATION, in which he urges the necessity, not of further advances in the curriculum, but of a higher standard of preliminary education.

Now that the public school and the high school system have placed a good education within the reach of all, there is no excuse for illiteracy. He said: "No student should be allowed to matriculate in one of our Dental colleges who cannot read and write the English language correctly, and stand a satisfactory examination in arithmetic, algebra and geometry, and should be a fairly good Latin scholar."

While it is true that this would shut out many who now apply for admission, this elevated standard of admission would raise the character of the profession in general and draw to our colleges many who now seek the other learned professions, while those who have not the stamina to reach the required standard, would probably do better in other occupation.

In the discussion Dr. J. Y. CRAWFORD spoke of the intimate connection between dental education and dental legislation, both pointing to a higher standard.

What is most needed in the line of dental education is the education of those who are in need of dental services. This is especially needed is a change in the methods of license to practice. A man who is fit to practice dentistry in one State is fit to practice in all without further examination.

Dr. CRAWFORD also spoke at length on the subject of Ethics,

based on the question of WHAT IS RIGHT, on which he said he would have something to say as President of the American Dental Association.

DR. FRANK HOLLAND does not think the study of Latin essential, the college text-books, dictionaries and lexicons supplying a man with all that is essential to a knowledge of the theory and practice of dentistry. He spoke of the contradiction involved in the fact that in Georgia, and probably in other States where there are Dental Colleges duly chartered under the laws of the State, a State Board created by the State, can go back on the diploma of a college also created by the State. One conferring a diploma entitling a man to practice dentistry, the other saying you cannot practice under that diploma. This is a state of affairs that requires to be remedied.

DR. STUBBLEFIELD said the colleges only work on the material which gives supply. If you send your boys to the colleges before they are qualified to study law or medicine or dentistry, we can only take them as we find them. Take your boys in hand and say—prepare yourselves, by education, to enter the colleges. See what your boys are doing, and know what they are fitted for.

DR. W. T. MARTIN, Yazoo City, spoke of the great difficulties met with in the earlier efforts to secure legislation along this line and the great advances made all along the lines of legislation and education.

DR. W. E. WALKER (calling the Vice-President to the chair) said that he did not think the degree conferred by the dental colleges was sufficient experience, nor the license conferred by the State Boards sufficiently comprehensive to meet the present status of advanced dental practice. He said: “. . . I do not think we should be confined in name—as we certainly are not in practice—to surgical operations *upon the teeth*. We receive from our colleges the degree of Doctor of Dental Surgery, but it is an admitted fact, that we cannot practice our profession successfully if we limit ourselves to treating *the teeth*, without in very many cases treating the surrounding tissues.” “. . . Abscesses, where there are no teeth left; diseases of the antrum; necrosis of the maxillaries,” etc. The time will come—has it not already come? when we need a broader degree. He said that, having been appointed to prepare a paper on Dental Education for the coming meeting of the Southern Dental Association, he had given

the matter some thought, and had entered into correspondence with the Deans of many of the Dental Colleges, and had reached the conclusion that what it wanted is such a degree as might be represented by "S. D.—STOMATOLOGIAES DOCTOR—to which the degree of M. D. and also D. D. S. should be a pre-requisite, representing the education which a man receives in both medicine and dentistry. This would be a step in advance and of a perfect parity with the advances in dental and medical science. . . . To attain the highest degree of ability in both technique and knowledge, the courses in medicine and dentistry should run *paripassu* for at least four years, devoting a few hours each day, during the entire course, to the development of skill—manipulative ability—of the highest degree. The student, having graduated as both M. D. and D. D. S., would then be entitled to the degree S. D., having acquired all that is necessary for the month—doctor—stomatologiae doctor. He said: . . . Our Dental College text-books do not go far enough in the line of medical education. I have often had to go to a medical library—fortunately on the same floor as my own office—to find the information, not contained in our text-books, but imperatively needed for some case in hand. If our text-books do not go far enough, certainly our colleges do not go far enough."

DR. T. C. WEST illustrated the importance of early training, comparing the impressions made upon the brain to a footpath across a field—the first passer-by leaving scarcely a trace, successive travelers deepening the pathway, until finally a well worn path is trodden down. He also compared it with imprints made in plaster; so easy at first, while it is still plastic; so difficult to impress when hardened by age.

The Report of the Committee on Dental Legislation elicited a discussion of the subject of the promiscuous extraction of teeth by the laity, and the injection of patent nostrums for "painless extraction." It is the hope of the association, through its legislative committee, to secure much needed legislation in this matter.

The chairman of the committee, DR. J. H. MAGRUDER, read portions of correspondence between the committee and Dr. E. C. Kirk, editor of the *Cosmos*, showing what efforts are being made in Pennsylvania, also, to secure legislation of this character.

DR. W. E. WALKER, Pass Christian, read a paper giving the history of three cases of

ABSCESSSES ON THE ROOTS OF TEETH CONTAINING VITAL PULPS,

falling under his own observation and treatment. In the first case, occurring some five years ago, the tooth had all the appearance of vitality, being sound and the gingival margins intact. An acute abscess, about the buccal roots of a left superior molar, causing the tooth to protrude from the socket, seemingly pointed to a dead pulp as cause. On drilling into the molar, however, the dentine was found to be normally sensitive. Opening into the pulp chamber was abandoned, and the case was treated systematically, and the tissues locally. He did not succeed in absorbing the abscess, but after lancing, the sinus healed spontaneously as with common phlegmons.

The second case was seen about seven months ago. The patient presented having lost an oxyphosphate filling from a mesial cavity in the left lower lateral, which had been in place about five years. The patient had suffered severe pain, the tooth protruding and very tender; swelling over the apex of the root. The filling having been out about ten days. The indications were again those arising from obscure position of the pulp. Drilling towards the pulp chamber with a small keen bur, showed the dentine to be very sensitive. A dressing seal filling was therefore inserted and calcium sulphide prescribed, and the gum painted with equal parts aconite, iodin and chloroform. The patient returned the next day with everything comfortable, and at the end of a week, in normal condition, when the cavity was permanently filled.

The third case was more complicated. A chronic alveolar abscess was found at the right upper second bicuspid, the tooth having been devitalized and crowned to serve as an abutment for a bridge, in service for ten years. The patient was uncertain how long the abscess had been present. Drilling through the gold crown and oxyphosphate filling, an obstacle was encountered in the lingual root canal, and on removal of the bridge and crown (further progress in cleaning the root canal being impossible) the obstruction was found to be a plugger point! The canal was cleaned, thoroughly impregnated with an antiseptic and the root filled; the abscess healing completely within forty-eight hours.

In the same mouth, the right upper lateral had a chronic abscess discharging through the labial surface of the gum, mid-

way between the gingival margin and the apex. The gingival margin was intact. The tooth had large approximal gold fillings in both mesial and distal surfaces, and was so badly discolored as to leave little room for doubt but that the pulp was devitalized. Here, again, drilling into the lingual surface, in order not to disturb the fillings, while the dentine was not very sensitive, a living pulp was found, though it had receded some distance, probably from the close proximity of the gold fillings, and also the age of the patient. After drilling through secondary dentine, the living pulp was reached nearly as high as the cervix. This pathological condition favoring pulp nodules, arsenic was applied to devitalize the pulp. The abscess was then probed, striking the root at right angles to its surface, half way from cervix to apex, but not traceable any further in any direction. The sinus was packed with cotton, for several days, to enlarge it for examination, when some granules of serumal calculus were found in the root. They were removed mechanically, followed by a drop of trichloroacetic acid, left in the sinus till the burned tissue came away, when the sinus was found to be completely cured, and this while the arsenical application was still in position, and the pulp not yet dead. At the proper time the pulp was removed and the root canal filled. There is no tendency to recurrence of the abscess, and no connection was found between abscess and pulp chamber.

The paper was discussed briefly.

DR. L. A. SMITH, Port Gibson, reported a case similar to the second case described in the paper. He could find no cause for the abscess, which healed on being treated through the fistulous opening.

DR. WALKER considered the second case he had described as due to the serumal calculus on the side of the root, the pus caused by this irritation forming an abscess and forcing its way through a fistulous opening, instead of appearing at the gingival margin, as in the ordinary form of pyorrhea alveolaris.

Papers by DR. L. A. SMITH, entitled "INFLAMED AND ABSCESSSED TEETH, AND METHODS OF TREATMENT;" by DR. P. H. WRIGHT, on "FERMENTATION OF CARBOHYDRATES AS THE PRINCIPAL CAUSE OF ACIDITY IN THE HUMAN MOUTH," and by DR. T. C. WEST, on "FILLINGS, AND THE CAUSES OF FAILURE," were read by title and ordered published, for want of time for discussion. By the dental law of Mississippi, the Board of Dental Examiners is

appointed by the governor, at his own discretion, though usually on the recommendation of the association.

The election of officers was singularly harmonious, but one candidate being nominated for each office, as follows: Dr. J. C. West, Natchez, *President*; Dr. Frank Smith, Water Valley, *Vice-President*; Dr. L. H. Jeffries, Natches, *Secretary*; Dr. C. C. Crowder, Kosciusko, *Treasurer*.

Jackson is the permanent place of meeting, "the domicile" of the association, according to the charter.

The time of meeting was left to be announced by the executive committee, dependent upon the date fixed by the governor for the meeting of the Board of Examiners (if a contemplated amendment to the dental law is received permitting the time of the Board meeting to vary with future extended college terms, thus permitting attendance of students immediately after college commencement exercises.)

After the usual ceremonies of installing the newly-elected officers, the association adjourned, to meet in Jackson, in the spring of 1896.

ALL SORTS.

For Setting Crowns.—Mix, with heat and careful working, one part of gutta-percha and three parts of vermilion. For setting porcelain crowns with pins extending in the root canal, or gold crowns and caps, this combination will be found strongly resistant to the action of the mouth fluids.—*W. H. Rollins*.

New Impression Cup.—Mr. J. D'Argent, at the Odontological meeting in Paris, presented a new impression cup. It is double in its construction, leaving a vacuum between the upper and lower flooring. In taking an impression with compound a current of cold water is passed; in twenty seconds the impression is hard. With this new device the operation is done quickly and there is less drawing.—*L'Odontologie*.

Be Thorough.—To prepare a cavity, always cut till you come to something good at the cervical margin, even if it should be necessary to cut all the enamel away at the cervix. Cut wide bucco-lingually, extending to the angles of the cusps and including them if thin or of poor texture. The cusp angles are not of much importance in supporting the filling by this method of anchorage, and should be cut away till the strongest possible border can be secured, and restoration be made with the filling.—*Items*.

Coloring Aluminum.—A method of coloring aluminum has lately been patented by Ida Ouaglio, of Berlin. The objects made from aluminum are first covered with zinc and then colored black by a solution of either platinum, copper, nickel or antimony a varnish being employed to protect the designs.—*Jour. Brit. Dental Association.*

A Broken Plate-Holder.—A good method for holding a broken rubber plate in position while it is being waxed up, is to take a round tin box four inches in diameter and two inches deep, with a perforated bottom. Fill this box nearly full of very fine shot. Place the pieces of broken plate in position as they should be, then press down into the shot, drop on the hot wax, and hold box under stream of water to cool. The water will run out through perforations in the bottom.—*F. E. Buck, in Items of Interest.*

Filling Pulpless Teeth with Fistulous Opening.—"After getting a direct opening into the pulp chamber, and thoroughly washing out its contents with warm water from a syringe, apply the rubber dam, and dry out the pulp chamber with cotton and hot air, then with Gates-Glidden drills of different sizes, enlarge the canals to the apex; now twist a few shreds of cotton around a Donaldson broach, and saturating in pure carbolic acid and iodoform, use as a piston until the medicament appears at the fistulous opening, and do not cease until it does appear.

Now your tooth is ready to fill; do not wait a day or a week, but go right ahead and fill solidly to the apex. I use shreds of cotton saturated with chloro-percha, and a touch of iodoform, and have yet to see a case of this kind come back to me for treatment in a practice of fifteen years."—*A. D. Cameron, Dom. Journal.*

Formalin.—In speaking of the uses of this disinfectant, Dr. G. Forsman says, in the *Brit. Journal*: "A strong solution of formalin, 30 per cent., causes pain to the epidermis, the mucous membrane of the mouth, and in deep cavities, so that in the first case mentioned, the epidermis hardens, and is afterwards thrown off, while in the two latter cases no inconvenience at all arises. A solution of 1 per thousand can be used for rinsing the mouth and throat.

When treating partially inflamed pulps, I find that a 1—5 per cent. solution gives a satisfactory result, as besides being an antiseptic, formalin also acts as an astringent.

A filling can at once be placed above a cauterized and amputated pulp which has been treated with a 30 per cent solution of formalin provided a piece of carbonized wadding, dipped in the solution, be applied to the roots of the pulp. I have, however, only done this in those cases where the patients needed very rapid treatment, having otherwise inserted

an application for one or two days, after which time the procedure just mentioned was undertaken. After being treated with such a solution for twenty-four hours the roots of the pulp are found to be gray and hard though elastic.

For disinfecting teeth with gangrenous pulps, root canals that have been open for a long time, alveolar abscesses and periosteal inflammations, I have used the same with great success. In root canals solutions of 20—30 per cent., in alveoli or abscess cavities solutions of 1—5 per cent., according to the quantity it is possible to use. The pain that may possibly arise when injecting it in the alveolus, or when syringing it, is easily alleviated by cocain."

Dr. Geo. W. Schwartz gives his method of Crown-Work, in the *Dental Review*, as follows:—"In making crowns for the anterior teeth in a number of cases it is not desirable to band the roots. Crowns baked to a post are conceded to be the strongest that are easily made.

Prepare the root by grinding even just below the free margin of the gum; take a piece of platinum, No. 33 or 34, a little larger than the prepared root, anneal it well, then burnish it up to the end of the root. This is easily done with the rubber of an ordinary lead pencil. Place the platinum on the root, hold it in place with the rubber end of the pencil, tap the pencil with a mallet, and you have a good impression of the root. Trim this platinum to the exact margin of the end of the root. Next comes the post, which is easily made; take a piece of platinum plate narrower at the top than the bottom, fold it twice, and flow a small piece of pure gold on it to stiffen it and hold the joints together. Put the platinum plate on the end of the root, punch the hole for the post, push the post to place, remove and solder with pure gold, select a plate tooth and fit to the post which has been left long for the pins of the tooth to be pinched around. By this method you can get the exact position you desire for the tooth. Having the tooth in place, solder the post and and tooth together with pure gold. This can be quickly and safely done without investment by putting the gold in place and placing the case in the furnace, gradually heating the furnace until the gold flows. After cooling, you are now ready to restore contour of the lingual surface in porcelain by building up with Close's body, and baking. If you wish, after the crown is finished you can remove the platinum from the crown, and you still have a perfect fit and an ideal crown."

Combinations of Metals in Amalgams.—In an article in the *Dental Review* on this subject, Dr. W. V. B. Ames, says:

"If it can be ascertained that a smaller proportion of tin than the two-fifths of the better alloys is sufficient to counteract the expansion of

silver, then we will have in the precipitates the means of obtaining ready amalgamation even in a very high grade amalgam. In experiments with silver, tin and mercury, I have been able to use as high as 90 per cent. of tin without noticing any unfortunate results from expansion. This mixture makes a very satisfactory filling in the mouth, having a dense surface, good color and fairly good working qualities under the instrument. With it glass tubes can be filled so as to show no leakage and without breaking of the tubes from expansion.

In making combinations of silver and gold with mercury, the proportions have extended from 80 per cent. silver, 20 per cent. gold, to 95 per cent. silver, 5 per cent. gold, the latter being found most desirable, and judging by the use of gold by manufacturers of alloys I suspect that a still smaller proportion of gold will cause the hardening of the mass. These mixtures, however, almost invariably break the glass tubes into which they are packed, so they have not been used in the filling of teeth. The mixture is a beautiful light colored and clean amalgam having a splendid texture, so I am still in hopes that it may be safely used in the filling of teeth. The gold appears to have decided advantage over tin in the causing of the hardening of silver amalgam since gold with mercury has itself to a remarkable degree that crepitation which indicates structure, while tin with mercury is almost devoid of structure, being simply an unctious mass.

A small proportion of copper will also cause the hardening of silver amalgam, but does not seem to control the expansion entirely, as glass tubes are broken during the process of hardening. In the use of this a certain amount of silver precipitate is amalgamated with a known amount of mercury, and a known amount of copper amalgam softened by heat and the two mixed."

Crown Work.—In an article in the *Dental Review*, Dr. G. W. Schwartz says:

"I think there is no more artificial looking work done on the natural teeth than crown work as it is commonly done at the present time. I consider crown work the most important part of porcelain work. It can be applied to nearly every case where any other crown work can, and to a number of cases where other work cannot. Any style of crown one chooses to make can be made by the dentist who bakes them himself. The crown I use most for incisors and cuspids is one made of a porcelain veneer baked to a platinum cap. The method I employ in constructing it is as follows: For a central lateral or cuspid, after having my tooth prepared I take the measurement in the usual way; then cut a strip of platinum No. 30 or 32 gauge, the width necessary, and a little longer

than the measurement; then lap to the exact measurement and solder with pure gold, festoon and fit to the root, mark the back, and trim out to the original shape of tooth. Solder a platinum backing to this about twenty-eight or thirty gauge. I now grind the front of this cap as thin as possible with a corundum wheel, and burnish it down to the tooth. This cap must be so shaped as to mechanically retain the porcelain when baked to it. After having the cap completed, which is the most important part of the crown, select a porcelain tooth the correct shade and size, which is ground to a thin veneer. After having first baked some body to the platinum cap, then bake the veneer to the cap which completes the crown.

For bicuspsids I use a different method. Having shortened the tooth to about one-half or one-third its length, with its buccal wall beveled to the center, fit a platinum band to it about the length of the original tooth. Then cut the buccal wall of this band in narrow strips to about a line or two from the gingival margin. These strips are to be burnished down to the shape of the prepared root. Solder these strips together with pure gold to hold them in place and to give the cap some stiffness. The articulating end of the cap is then trimmed until it is about two-thirds the length of the original tooth. Then proceed to build body on this cap to reproduce the shape of the tooth to be supplied, and bake it. When properly constructed, this is a very serviceable crown, as well as pleasing in its results.

If it is desirable, porcelain veneers can be used in bicuspsids as well as in other cases.

The advantage of this crown work over other kinds is, teeth can be crowned over live pulps. Also in some cases where there has been some recession of the gum, a restoration can be made with gum enamel to give the proper length and natural appearance.

Porcelain bridges adjusted to cases where the bite is short and overlapping, having proven unsatisfactory in my practice. I have had bad results in cases where I have baked facings to platinum backings. The force of mastication has fractured the porcelain porcelain from the backings, and nothing left but the backing and abutments.

I think porcelain bridges, to be strong, should be made in most cases with a saddle, and the porcelain baked to it.

In cases where recession of the gum has progressed to some extent, I bake gum enamel to the teeth to be supplied and restore the lost gum.

Make the abutments for this case as in any other work of gold bridging up to fitting in the teeth; for this select plain plate teeth to fill the space, then fasten them lightly together with thin platinum plate and bake them together with Close's body, after which supply the lost gum in

enamel, then remove platinum plate, back up with pure gold and proceed as in any other bridge-work.

Some spaces can be bridged very well by soldering plate teeth to a platinum bar and baking porcelain on it to restore contour and give the correct masticating surface."

Some Points on Solutions of Iodin.—Dr. W. B. Ames has had satisfactory results from the use of iodine preparations as dressings for pulpless teeth, etc. In an article in the *Dental Review* he says:

"Iodine is soluble to some extent in all volatile oils and most other fluid hydrocarbons. The ideal solvent seems to be terebene or other terpenes, having the composition $C_{10}H_{16}$. Terebene will dissolve twice its own weight of iodine and yet have a decidedly fluid consistency. The solubility of iodine is peculiarly affected by the presence of tannin, which fact immediately suggests its use in connection with the solution of tannin in glycerin much used as an application to recently devitalized pulps. While plain glycerin will dissolve only about 1 grain to the dram, if tannin be added in proper quantity at least ten times that quantity will be readily taken up.

The use of solutions of iodine in such agents as creosote, carbolic acid and campho-phenique are precluded by their objectionable odor. The most valuable solution of iodine resulting from my experiments has been that in oil of cassia. Pure cassia with iodine dissolved to the extent of 2 grains to the dram by weight will make a syrupy solution, which seems to be a new compound differing radically from its components, being less irritant than either of the constituents. Its syrupy nature renders it easy of application to pulp canals. It is only slightly soluble in water, and yet such solution gives all appearances of being a potent germicide and antiseptic. From my use of this combination I feel more confidence depending upon it as a dressing to be sealed up for months, or possibly permanently, than any dressing previously used. If pure cassia is used the mixture will become in time quite hard, so that it is necessary to make a fresh solution from time to time. This hardening or stiffening answers a useful purpose oftentimes when used as a dressing or pulp chamber filling, as it becomes in that state almost insoluble. For the temporary setting of crowns, a solution that has become quite stiff can be used as so much cement or gutta-percha, softening it somewhat if necessary by immersing in hot water the bottle or jar in which it is contained, the material stiffening again when cold. If a crown fits a root accurately it is held most satisfactorily with this *antiseptic glue*. I have taken them off after being worn for several weeks, set with this, finding a thoroughly aseptic condition within. For this temporary setting of crowns it is a great success when used of the proper consistency.

If it is desired to overcome the tendency to become hard in this mixture of cassia and iodine, a trace of terebene can be relied upon for that purpose. In the solution of 2 grains of iodine in a dram of cassia, 1 or 2 per cent. of terebene is sufficient, or by using a little more terebene, it is practicable to dissolve more iodine, obtaining probably a more potent mixture and the same syrup consistency. For instance the following parts by weight might be used :

Pure oil cassia,	. . . . .	1 oz.
Terebene,	. . . . .	5 gr.
Iodine,	. . . . .	5 gr.

By incorporating a sufficient quantity of a suitable insoluble mineral or metallic oxide with the cassia and iodine solution, a mixture similar to iodoform paste is obtained without the same disagreeable features. It is extremely essential that the oil of cassia be pure. Many samples contain a sufficient proportion of other oils, especially that of cloves, to render the solutions of iodine unsatisfactory. The oil of Ceylon cinnamon is not as satisfactory for this purpose as the oil of cassia."

Consideration of Amalgams.—In the continued article, now being printed in the *Dental Cosmos*, from the pen of Dr. G. V. Black, we notice the following regarding amalgam :

"The strongest mass I have been able to produce has been had by mixing in the hand until there was a fairly even distribution of the mercury, *and no longer*, and then wringing out by rolling the mass in muslin, maintaining the pressure some moments, then discarding the ends of the mass and packing carefully and evenly with a rather light, steady pressure, with as broad a point as could be conveniently used, being especially careful not to raise any free mercury to the surface. This method is so extremely difficult that I doubt its practicability for the ordinary practitioner. The method that has given the next best results has been to use a stronger pressure, and carefully remove all free mercury and softened portions of the mass as it arises. There is but little difference between this and the method of burnishing in the filling, provided the burnishing is carried out evenly and moderately. An important principle is that after mercury is mixed with the alloy and evenly distributed, *any form of violence weakens the product*. Therefore severe burnishing makes a weak filling. Apparently for the same reason, mixing or grinding the mass in a wedgwood mortar weakens the product. Grinding in a mortar causes the alloy to take up more mercury than when mixed in the hand or in a rubber mortar, but even when given the same percentage of mercury the product will be weaker. An excess of mercury over a certain percentage (differing a little with different alloys) makes a weak mass ; but quite a wide range may be allowed without very marked difference.

The most of the alloys are nearly equally good with a range of from thirty to forty-five per cent. of mercury. I had supposed that it would make no difference how the excess of mercury was removed, so that it was removed; but I find that it does make a difference, and especially it cannot be removed while packing without weakening the product. Squeezing the mass in a vise seems to cause irregularity in results, partly because of the violence, but mostly because of the uneven removal of the mercury, the margins retaining much more than the central portions of the mass. Within the range given above, the even distribution of the mercury is much more important than the amount. The crushing strength proves to be no test of the stability of an amalgam. Its flow is the important test. Every silver-tin amalgam in the market, so far as I have seen is, when mixed with a sufficiently low percentage of mercury, strong enough so that they will not *break* down, they will not crush. The chief difficulty is that many of them will gradually change form under the stress of mastication, as it comes upon them, thrust after thrust, year after year. When subjected to heavy biting, they will finally be moved sufficiently to lose their perfect margins. This is the principal cause of that *black ditch* that is finally seen along the margins of silver-tin amalgam fillings that have been nice and perfect the first year. This does not occur along the margins of copper amalgam fillings. The copper amalgams do not flow. Experiments with them show, that they hold their form perfectly under any stress short of that which crushes them. Therefore, when perfect margins are once made with copper amalgam, they remain perfect. Not so with the silver-tin amalgams. Their disposition to flow under stress allows them to be moved in the teeth of those who bite strongly, and they lose their perfect margins in consequence of this movement. It is for this reason that I attach such importance to the flow."

Compressed Air in Dentistry.—In an essay read at the Illinois State Society, and published in the July issue of the *Dental Review*, Dr. C. C. Southwell says:

"Following is a brief description of the simple outfit I have in use. Attached above my laboratory sink and to the city water service I have an automatic air pump. This is piped to reach a common kitchen hot water tank or boiler, which for economy of space, I have suspended from the ceiling. This in turn is piped to both laboratory bench and operating chair. I strongly advise against the overuse of rubber tubing. It is unsightly, the unions are seldom tight and in time it will disintegrate. On the other hand metal pipe or tubing once properly united would remain indefinitely.

Beginning with the laboratory I need only mention its chief use,

namely, soldering. One of the most frequent causes of pain and discomfort during and succeeding the introduction of a large filling is the excessive use of ligatures and clamps for the retention of the rubber dam. These can be dispensed with in almost every instance, to be used only as aids in its first adjustment.

Please use the thread and clamp only as conveniences in getting the rubber dam in place; wipe away the excess of saliva with cotton or bibulous paper, then a strong blast of air warmed if need be, will so dry the surface of the average tooth, that the dam will remain in place to the end of the operation, barring accidents, that the thread and clamp would not wholly meet.

The above procedure gradually and studiously adopted will enable one to dispense very largely with both ligature and vile clamp.

In the absence of electricity, a coil of metal tubing over the ordinary alcohol flame used for annealing gold will serve admirably and an ordinary flow of air can be heated in thirty seconds and kept heated. Raise the flame or increase the current and with a delicate nozzle you have suggested a more perfect and amenable root canal driver than it has been my pleasure to see in operation.

To return the air to the temperature of the room requires but a few seconds and with this same small nozzle, directing a flow of air on a filling being finished by the invaluable sandpaper disk of to-day, the usual pain from overheating can be wholly dispensed with.

The hastening of the evaporation of volatiles and the better application for the reduction of temperature and consequent lessening pain during the use of the bur in the preparation of cavities or for the extraction of teeth, a strong and easily controlled pressure on an ordinary atomizer will prove itself invaluable.

One of the several and possibly the chief reason for the failure of crowns and bridge work lies in the fact that the drying of the foundation is difficult, and to keep it dry is still more so.

A steady forcible blast at a pressure of fifteen to twenty-five pounds will not only dry the foundation, but the force of the blast will inhibit the weeping of viscid saliva or blood from the gums positively and perfectly.

Continuing this dry recitation I have hut to mention the efficiency of a strong pointed blast in revealing hidden pieces of tartar in pyogenic cavities. This must appeal to the discriminative mind at once.

If you will bring to mind the troublesome approximal cavity which presents itself to the busy operator every day it will require no labored flight of fancy to realize the soothing effect of a gentle flow of air, at about 100° F., directed into the cavity, beginning as soon as the dam is

well adjusted and continued by the assistant until the dentine is protected by the capping or filling.

Advocates of the capping of pulps will find the steady flow of warm air an invaluable adjunct. The softened laminae of dentine, thoroughly desiccated, have long been believed to be the only desirable capping, needing but a slight covering or intermingling of oxyphosphate as a protection against subsequent pressure.

The occasional perplexing so-called submarine filling can be made a very simple problem by a well-directed stream of air, for with the dam reasonably well in place it will require but little ingenuity to meet any ordinary emergency.

In the fitting of bands I find it of frequent and valuable service in driving out the collection of saliva, or both saliva and blood, enabling me to quickly locate and adjust irregularities."

Practical Methods.—The following are extracted from the *Cosmos'* report of the First District Dental Society meeting :

A Method of Supporting Loose Lower Front Teeth by Firmly Securing Them to a Bar of Suitable Width Accurately Fitted to the Lingual Surfaces, by Dr. W. H. Trueman.

First. Through each tooth that is to be secured to the bar, clear through from the labial to the lingual surfaces, drill a hole to accommodate a screw-threaded wire, locating the same as nearly central as may be to the width of the tooth, and sufficiently near the cutting-edge to avoid encroaching upon the pulp.

Second. Accurately fit a bar, preferably made of a strong metal so as to secure strength without bulk, to the lingual surfaces of the teeth. It is desirable that this bar shall approach closely the cutting-edges of the teeth, and extend toward the gums sufficiently far that the lower edge will be below the most prominent portion of the tooth, and so less noticeable to the tongue. It is also desirable that it shall fit accurately the surface of the tooth, forming a matrix in which the tooth rests. The bar must be sufficiently thick to afford secure hold to the screws by which it is drawn closely to the teeth.

Third. Being provided with a screw tap, screw-threaded wire, screw nuts, and a drill to match, hold the bar firmly in place, pass the drill through the hole in any one of the teeth most convenient, and continue the hole through the bar. Withdrawing the drill, while the bar is still in place, tap the hole just made. It is important in most cases that the hole be threaded while the bar is in position, otherwise during the operation the direction of the hole may be changed. Now pass the threaded wire through the tooth and screw it into the bar, cut it off

allowing it to project beyond the labial surface of the tooth sufficient to accommodate a screw nut. If it can be done, it is best to solder the screw to the bar. The screw and bar in place, put a nut on the end of the screw projecting beyond the labial surface of the tooth, and draw it tight. In like manner proceed until each tooth is fitted with a screw and nut.

Fourth. Remove all the screws, laying them down in order so that they can again be quickly replaced; coat each nut with a little oil or vaseline; dry the teeth, coat them and the bar with zinc-phosphate cement, quickly place it in position, and immediately insert the screws, coating each one as it is placed in position with cement, and draw the nuts evenly tight. It is desirable that the cement shall fill all space between the bar and the teeth, and as thoroughly fill the holes through which the screws pass. After all is in place, it is well to work the cement between the teeth, filling any spaces which may offer lodgment to food *debris*.

Fifth. After the cement has well hardened, with suitable tools smooth off the ends of the screws projecting through the bar; then remove the nuts, clip off the projecting ends of the screws, and polish them down even with the surfaces of the teeth, and remove the superfluous cement.

Obtunding Sensitive Dentine.—Dr. G. F. Harwood, Worcester, Mass., gave a demonstration, using simple remedies. Method: Inclosed teeth in dam, cleansed the surfaces and cavities with alcohol, varnished the teeth (except the cavity to be excavated) with sandarac to protect from the air, either hot or cold; dried the cavity with warm air, applied eugenol oil, this remaining a few moments was generally sufficient. In case of extreme sensitiveness washed out the eugenol oil and applied the "Robinson Remedy," or followed with chloroform and tinc. aconite root. He proved the efficiency of the "B. & R. hot-air syringe," which can be used with one hand, and the "Elliott separator," not new, but notable for its simplicity. He demonstrated this method upon a right superior central (very sensitive) approximal cavity, entirely controlling sensation, and upon a lower cuspid labial cavity, which was also found highly sensitive. The patient claimed that he felt no pain.

Immediate and Painless Removal of Living Pulps of left superior first molar, and right superior first bicuspid, after injecting into the pulp-chamber a 10 per cent. solution of cocain; the essential point to be demonstrated being the avoidance of all contact of the syringe-point with sensitive pulp-tissue. This is attained by having a selection of sizes and shapes of syringe-points, some with flanges for supporting Dunn syringe rubber cones, so the point may be fitted to the perforation into the pulp-

chamber, making a tight joint at that point. If necessary, the immediate point of exposure is to be first dressed with a syrup mixture of 95 per cent. carbolic acid and cocaine, or other painless caustic, so the syringe-point shall not crush sensitive fibers. In cases difficult of access a temporary filling may be made with an opening through it, and the syringe-point fitted to the opening at the mouth of the cavity.

Electro-Deposition for Making Crowns, Bridges, or Plates.—Dr. L. B. Wilson, Cumberland, Md., presented models demonstrating his method, which consists in first taking a plaster impression. If for crowns which are decayed away and shape lost, he simply takes wax and wax-knife in the operating-room and builds up on the broken or decayed tooth or teeth wax ends that correspond in size and shape to the natural tooth adjoining, then has the patient close his teeth to get antagonism.

Then take a plaster impression; build up the edges with more plaster; dry and pour in fusible metal (before the fusible metal sets place in it a good sized copper wire), separate, and cover the fusible metal with melted wax in all parts where one does not want the deposition to take place.

If for a bridge where porcelain teeth and metal caps are to be used, solder wide tissue platinum backings to all the porcelain teeth, slip the edges of the backings under each other on the plaster model, using just enough wax to hold them in position; remove from the model, place in the mouth and take a plaster impression (the porcelain teeth will all come away with the impression), pour in hot water to wash out the wax, dry, and pour in fusible metal and proceed as before described.

Plates are more simple to make by the same method. For the deposition use three solutions, gold, copper, and copper and aluminum. The last named is made by mixing the copper and aluminum solutions together, and all the solutions are kept at a temperature of 100° F. while the deposit is going on (time required, twenty-five hours). Place them first in the copper solution for ten hours; remove them, and at once place them in the gold solution for fifteen hours, when the shell on the models will be found sufficiently thick; then remove them, melt out the fusible metal, and finish up.

Method of Making all Gold Incisors and Cuspids.—It consists simply of three hard metal plate-dies representing both labial and lingual surfaces, with central, lateral and cuspid dies in separate plates for convenience in handling, and an asbestos ring for molding the hub. This system supplies a variety of forms for the various teeth, sufficient to cover almost any case.

Glancing over the dies, select the size and shape you think is right; determine certainly by making a wax impression from the die and trying

in the mouth, or on a plaster model. Having thus selected the die to be used, take the asbestos ring, place over the die selected, and cast therein lead for a counter-die; then remove your counter-die and proceed to swage up your gold cap, both sections at once, after which cut, trim, solder and fit, as in other methods.

A Method for Crowns and Bridges by Dr. S. S. Stowell.—Having established the abutments of the bridge with the crown in place, a 'bite' of plaster of Paris is taken, and crowns removed with the bite. Models are made from the 'bite,' using the crown articulator. The 'bite' is cut away, leaving the crowns in place on the models as they were in the mouth, with the occluding teeth held by the articulator. Porcelain facings are fitted between the abutments and against the gum, leaving one-thirty-second of an inch space at occluding or biting surface.

The facings are backed with pure gold, and held in place with wax.

Using the die plate, a set of hollow copper cusps are swaged No. 32. These cusps are selected and placed in position over the tip of the facing and against occluding teeth. Being thin and soft they are easily bent and burnished so as to fit the occluding teeth, conforming to any irregularity of surface to a nicety.

Support cusps with soft wax. Open articulator and take small impression of cusps, allowing plaster to extend onto either abutment. Remove plaster, taking with it all the copper cusps, and with this plaster transfer cusps to a smooth surface of Melotte's moldine. Place over this the rubber rings and make a die and counter-die of Melotte's metal, and swage a strip of No. 32 high-carat gold to extend when in place from one abutment to the other. This is waxed in place, and the case is ready to solder.

The advantages are that the case is completed at one soldering. The occlusion is perfect, as the thin cusps conform to the surface of occluding teeth. Much time is saved, as the "dummies" are all soldered with the bridge at one heating."

An Investigation of the Physical Characters of the Human Teeth in Relation to their Diseases, and to Practical Dental Operations, together with the Physical Character of Filling-Materials.—An article on the above subject by Dr. G. V. Black, is now running in the *Dental Cosmos*. Every one knows what a careful investigator Dr. Black is and to get the full benefit of his researches the article should be read *in toto*. It is the most original and important contribution to dental science that has appeared for some years. His conclusion after an extended series of experiments on the physical character of the teeth, are as follows:

“From the facts developed in this investigation, it seems that the following conclusions may be summarized:

The teeth are strongest in youth and early adult age, diminishing somewhat in strength with advancing age.

Teeth that have lost their pulps and have become discolored lose strength in a marked degree, apparently from a deterioration of the organic matrix.

Teeth that have become badly worn from mastication, and in which the pulps become so much calcified as to cut off the nutrition of the crown portions of the dentine, lose strength, apparently from deterioration of the organic matrix.

Teeth of old people, and especially those in which much calcification of the pulps occurs, deteriorate in strength.

There is no basis for the supposition that the teeth of children under the age of twelve years are *too soft to receive metallic fillings*.

Differences in density or in the percentage of lime-salts in the teeth is not the controlling factor in the strength of the teeth, nor their hardness, this seeming to depend upon the condition of the organic matrix.

Differences in the strength of the teeth have no influence as to their liability to caries. Differences in the density, or in the percentage of lime-salts in the teeth, has no influence as to their liability to caries.

The active cause of caries is a thing apart from the thing themselves acting upon them from without, and from a consideration of the facts thus far developed, the logical inference is, that the cause of the differences in the liability of individuals to caries of the teeth is something in the constitution, operating through the oral fluids, and acting upon the active cause of caries, hindering, or intensifying, its effects.

Caries of the teeth is not dependent upon any condition of the tissues of the teeth, but on conditions of their environment.

Imperfection of the teeth, such as pits, fissures, rough or uneven surfaces, and bad forms of interproximate contact, are causes of caries *only in the sense of giving opportunity for the action of the causes that induce caries*.

The objects to be attained in filling teeth are the perfect exclusion of the causes of caries from the tissues by sealing the cavity, *and securing such form as will prevent lodgments of debris about the margins of the filling*, and thus prevent the further action of the cause of caries.

There is no basis for the supposition that some teeth are too soft, or too poorly calcified, to bear filling with gold, or other metal in use for that purpose, since all are found to be abundantly strong.

There is no basis for the selection and adaptation of filling-materials to soft teeth, hard teeth, frail teeth (in structure), or poorly calcified teeth. What basis there may be in the *conditions surrounding the teeth* for

the selection and adaptation of filling materials must be left to future developments to discover.

With our present knowledge, the only basis for the selection and adaptation of filling-materials to classes of cases is the individual operator's judgment as to which he can so manipulate as to make the most perfect filling, considering the circumstances, his own skill, and the durability of materials.

There is no basis for the supposition that calcic inflammation of the peridental membranes or phagedenic pericementitis (so-called pyorrhea) attacks persons who have dense teeth in preference to those whose teeth are less dense.

There is no basis for the treatment of pregnant women medicinally with the view of furnishing lime-salts to prevent the softening of their teeth, or with the view of producing better calcified teeth in their offspring."

In regard to the predisposing causes of decay of the teeth, he speaks of microorganisms being present as well in mouths where there is no decay as in mouths where teeth caries is making sad havoc. He says:

"Then, if these micro-organisms are present in every human mouth, why is it that they induce caries in the teeth of the one and not in the teeth of another? Why is it that the teeth of one are quickly destroyed, while there are only a few slowly progressive decays in the teeth of the other? Indeed, all possible shades of difference, from the rapid melting down of the teeth to complete immunity from caries. The popular answer to these questions, both by the profession and the laity, has been,—*differences in the physical qualities of the teeth*. Teeth that contained but a small percentage of lime-salts, soft teeth, have been regarded as most susceptible to caries, while teeth that contained a large percentage of lime-salts, hard teeth, have been regarded as least susceptible to caries.

This is shown by the examination of the physical characters of the teeth to be a fallacy. Examination of the density, of the percentage of lime-salts, and of the strength of the teeth, that are certainly reasonably accurate, and include a sufficient number upon which to base trustworthy judgment, has shown that neither the density, nor the percentage of lime-salts, and of the strength of the teeth, that are certainly reasonably accurate, and include a sufficient number upon which to base trustworthy judgment, has shown that neither the density, nor the percentage of lime-salts, nor the strength, as in any degree a factor in predisposing the teeth to caries, or hindering its inception or progress.

The question now is,—what is the cause of the differences observed in the disposition of caries to attack the teeth of different individuals, other than those resulting from differences of form and of cleanliness?

In the present state of science no satisfactory answer can be given. The best that can be done is to suggest the direction that seems most promising for future study."

He then suggests the idea of the preventive cause being due to some deterrent substance in the blood which may appear also in the saliva. Here follows accounts of various experiments made by other investigators regarding the destructive action of blood-serum on different species of bacteria. Resuming, he says :

"While all of this may be different in its detail from anything we may expect to find in the human mouth, it illustrates a principle of the formation and action of deterrent proteids in the serum of the blood and in the secretions, and taken together with the fact of the breaking up of the organic acids in the blood, which has been mentioned, and the immunity of certain persons from caries of the teeth in the presence of the organisms productive of the disease, gives strong plausibility to the suggestion."

Further, he says :

"The conception that some power or influence is acting through the medium of the oral fluids to produce the differences is forced upon us by the consideration of the facts presented.

Still, it must not be forgotten that the degree of virulence of caries may be dependent in a measure upon still other influences.

It is now well known that the organisms producing caries become impotent in the complete absence of sugar, or other substances readily convertible into sugar. This cannot be supposed to occur in the human mouth. But vast differences in the supply of sugar, or sugar-forming substances, as starch, etc., occur, and the greater prevalence of caries in the teeth of millers, bakers, candy-makers, and persons who are habitually mincing sweetmeats, has been widely noted and generally attributed to this cause, that is, to the unusual supply of fermentable material. Differences in personal cleanliness and some other potent conditions must for the present bear the ignominy of being causative of extreme degrees of the carious processes. But how often do we witness cases of the worst type in persons in whom none of these are active."

In regard to the force exerted in the closure of the jaws, he gives the records of fifty "bites," on his measuring apparatus, the *gnathodynamometer*, which indicated the number of pounds pressure exerted. The smallest pressure recorded was 30 pounds by a little girl seven years old, and also a gentleman of thirty-five. This was with the incisors. The bites with the molars were respectively 65 and 70 pounds. The highest record was that of a physician, age 35. The instrument used measured

270 pounds, but he closed it together without apparent effort. Several persons exceeded a force of 100 pounds with the incisors, and 200 pounds with the molars.

Regarding the variations in force exerted Dr. Black says:

“With the exception of a few persons, the apparent physical strength seems not to be the controlling factor. Generally persons biting on the gnathodynamometer, and endeavoring to exert their full power, stop because it *hurts their teeth*, and not because they have exerted the full strength of their muscles. The *condition of the periodontal membranes* seems to be the controlling factor rather than muscular strength.”

Incidentally he speaks of the stress exerted upon artificial teeth as follows:

“While I have made no particular effort to obtain many tests of the stress that could be exerted by artificial teeth, I have tried a number of persons. On full plates, upper and lower, the stress exerted has been from twenty to thirty pounds. On upper plates with natural teeth below, forty pounds has been exerted in a few cases; and Dr. G. B. Cary, of Perry, Ill., a dentist, made the remarkable record of eighty pounds upon artificial teeth and natural teeth below. It must be said that the exertion of the full stress possible to artificial teeth is not practicable with the mouth opened as wide as is necessary in biting on the gnathodynamometer, but with all allowance for this, these trials show them to be sadly deficient in masticating power as compared with the natural organs. Perhaps it is well that so many persons fail to realize what they have lost, and, as the recovery of it is not within the range of possibility, perhaps the less said about it the better. But a study of the records of the gnathodynamometer and the records of the phagodynamometer, show only too plainly what it is.

In speaking of the stress necessary in the mastication of food he says: In the experiments, other forms of teeth, flat pieces of steel, etc., have been used. It is found that it requires more stress to crush food between flat surfaces than between tuberculated surfaces. It appears also that when the teeth have become so worn as to make what is called a perfect occlusion, the occlusal surfaces touching at all points, the stress required in mastication is greater than when the occlusion is less perfect. Long sharp cusps, with just a fair degree of closeness of the general surfaces and with a number of points of contact, seem to do the work well with the least stress. Teeth that are large call for more pounds' stress than small teeth. Food taken in large masses and covering a greater surface of teeth,—more teeth,—require greater stress; while if the food is cut fine, or is taken in very small masses so as not to cover so large an area of tooth surface, it may be crushed with less stress.” . . .

"It seems probable, however, that many persons unconsciously exert an enormous force upon such foods as are inclined to pack between the teeth. I am no longer surprised at the frequent breaking of frail teeth on bread crusts *that are not very hard*. It is but little wonder that porcelain facings on crowns and bridges are so often broken; and it seems to be a fact that many of the porcelain crowns upon roots stand only because there is sufficient irritation to cause the peridental membranes to be so tender as to induce the patients to avoid using them except on the softer foods."

Dr. Black found that, in the chewing of food stuffs much more force is exerted than is absolutely necessary.

His records show the crushing point of beefsteak to be from 40 to 80 pounds, mutton 30 to 45, roast veal 35 to 40, roast beef 35 to 68, broiled ham 40 to 60, cold boiled tongue 3 to 5. The tougher parts of beef and mutton required a crushing force of 80 to 90 pounds.

CHAPIN A. HARRIS MEMORIAL FUND.

BALTIMORE, May, 1895.

To the Dentists of the United States:

A movement is now in progress to insure a mortuary tribute to the memory of one of the greatest names in the annals of dentistry. It is proposed to adorn his neglected tomb at Mount Olivet Cemetery with a monumental testimonial worthy of his name and fame.

Mr. Ernest W. Keyser, the talented Baltimore sculptor, now in Paris, has modeled a remarkably faithful portrait bust of Dr. Harris and executed designs intended for a monument to be erected over his grave.

It is also in contemplation that should sufficient funds be realized a memorial tablet containing an alto relievo bronze bust of Dr. Harris be placed in both the Baltimore College of Dental Surgery and the dental department of the University of Maryland.

It is believed that the necessary funds can be obtained through voluntary subscriptions from the dental profession. The Snowden & Cowman Manufacturing Company of Baltimore has kindly consented to act as custodians of the "Harris Memorial Fund." Contributions are earnestly solicited and will be thankfully acknowledged. Address THE SNOWDEN & COWMAN M'FG Co., No. 9 West Fayette Street, Baltimore, Md.

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CONTRIBUTIONS.

A Study in Dental Anesthesia.*

BY N. S. HOFF, D.D.S., ANN ARBOR, MICH.

NITROUS OXID.

THE comparative safety of nitrous oxid as a general anesthetic has made it deservedly the most popular for all brief surgical operations, especially in dental practice. Its administration is, however, attended with so many objectionable symptoms that many good operators are unwilling to make use of it. The principal objection is its tendency to produce symptoms similar to asphyxia, if not identical, and consequent dangerous results. The most successful efforts to overcome this tendency have been those where oxygen has been combined with the nitrous oxid in some form as a corrective.

The advantages of nitrous oxid and oxygen lie in the fact that the asphyxiating symptoms are delayed or prevented and a larger quantity of nitrous oxid is presented to the sensory tissues and consequently more profound anesthesia results. More time is required for effects, but a somewhat relative lengthening of the period of insensibility follows.

I have no time to review in this abbreviated paper the experi-

* Abstract of a paper read at the Tri-State Dental Meeting, June, 1895.

The editor and publishers are not responsible for the views of authors of papers published in the OHIO DENTAL JOURNAL, nor for any claims that may be made by them.

ments of Prof. Paul Bert, who succeeded in maintaining complete anesthesia for 26 minutes with a mixture of N_2O O, with no unpleasant symptoms of any sort by administering the mixture under a pressure of one and one half atmospheres. Nor of Professor Hillischer, of Vienna, who obtained complete anesthesia for a shorter period with a similar mixture without the addition of atmospheric pressure. These experiments stimulated Professor Hewitt to investigate the subject and in a long series of experiments in over 800 cases, he came to the conclusion that it was a practicable idea and has invented a suitable appliance for the proper mixing and administration of these combined gases. He found by experiment that from 10 to 12 per cent. solution of O in N_2O answered general purposes, but that individuals required modification of the formula, and that an apparatus capable of ready and quick adjustment was necessary to meet various symptoms as they arose, and that no diagnosis was possible by which the best proportions of the gases could be prepared in advance, but the oxygen supply must be brought on as needed. This he claims to have effectively accomplished in his apparatus.

In using this mixture and apparatus in 67 tabulated administrations, it was found that anesthesia was brought on in 66 seconds as the shortest and 186 seconds as the longest period, and the shortest duration of complete anesthesia was 44 seconds and the longest 80 seconds. It is observed that recovery is not so prompt as with N_2O alone.

The quantity of O will vary with different persons and must be controlled by the administrator. It is best to begin with a small percentage and gradually increase it as indications demand. Excitement stage is shorter with a smaller per cent. of O. The face piece must fit accurately to exclude all air. Silence and absence of contact with the patient are essential to quiet and successful results without excitement or violence. The margin between the peaceful anesthesia of the mixture and the usual manifestations of nitrous oxid is so narrow that the patient must be closely watched. More oxygen should be given to debilitated or weak persons than to strong minded, stubborn or vigorous ones.

The conjunctival reflex is the best indication of complete anesthesia, but snoring and relaxation are also useful indications. The first application of the forceps will sometimes get a slight

reflex response, but not sufficient to require any further anesthetic.

Patients do not have the horrible dreams nor scream under the mixture as they do with nitrous oxid alone. They also feel better on recovering and present a better appearance. The tongue and mucous membrane are not congested or swollen. The mixture acts well in cases of weak circulation, as the pulse is stronger and steadier without the usual primary excitement of nitrous oxid and none of its after depressing effects.

The unfavorable action of the mixture causes considerable prostration, due to the longer and more complete anesthesia. A feeling of nausea and sometimes vomiting. More time must be given to recovery. More skill is required to administer it and strict attention to the manifestations and prompt application of remedial measures. More time is consumed in the operation.

It is recommended for use in children, anemic and debilitated patients; persons easily anesthetized by nitrous oxid.

Persons who do not take nitrous oxid kindly; old people, persons with diseased circulatory organs.

Some points for further study and investigation in this connection. I would suggest the following:

(1.) The use of gasometers to obtain required and uniform pressure, and the amount of pressure necessary to secure the best mixing or diffusion of the gases in definite proportions.

(2.) The extent to which this mixture may be used without injurious results, such as the paralysis of the vital nerve centers experienced with other anesthetics,

(3.) A qualitative analysis of the blood under complete anesthesia with the mixture, with special reference to its oxygen.

(4.) A careful experimentation as to the ultimate physiological effect upon the sensory tissues.

COCAIN.

In my early experience with cocain as a dental anesthetic I, like everyone else, encountered difficulties, or embarrassing situations to say the least, which tempted me to forego the use of this valuable drug as a safe and practicable local anesthetic. And yet its satisfactory obtundent qualities left no choice but to make use of it, although such use seemed to be attended with a considerable measure of hazard. Like many others, who have tasted of its beneficial action, I began experimenting with the drug to make

combinations which would render its use more practicable and safe. I began with a 6 per cent. solution for hypodermic use and on the basis that one grain could be safely used as a dose. I was not long in discovering that either the dose or concentration was entirely too high and as I now know both were. I experimented with various solutions, and finally came to the conclusion that for hypodermic injections a 2 per cent. solution in water was sufficiently saturated for any purpose, even for use in anesthetizing pulps, and in the majority of cases where it can be used, a 1 per cent. solution would accomplish definite and satisfactory results. I have even secured very satisfactory anesthesia, for extracting a tooth, with a solution of the strength of $\frac{1}{3}$ of 1 per cent. The dose of cocain I have gradually reduced from 1 grain hypodermically to from $\frac{1}{16}$ to $\frac{1}{2}$ gr.

It is well known to all that the great objection to cocain lies in its tendency to induce hysteria, when given in small doses, due to its stimulant effect upon the nervous system; and secondly its depressing action upon the respiration and heart when used in excessive doses. The tendency to hysteria and respiratory difficulties are the most important complications to consider, for the reason that they occur when least expected and sometimes with small doses, while the depressing heart effects only occur in peculiarly weak conditions of this organ, or as secondary to the respiratory difficulties or because of excessive dosage.

My first experiments to control this nervous excitement were with the standard narcotics, morphin and chloral. I soon found that many persons were highly susceptible to the use of morphin and that chloral was objectionable because of its bulk and its excessive irritating character when injected into the soft tissues, causing sloughing of the tissues. The experiments of Dr. Pruyne convinced me that morphin was the most accessible drug to control this excitement effect and on looking it up I found that atropin was morphin's great antagonist, especially against its poisonous and nauseating effects. I therefore began using a combination of cocain, morphin and atropin, and soon found that I had a satisfactorily corrected formula, and that the drugs seemed to harmonize therapeutically in producing a more powerful local anesthesia and that systemic disturbances were very rare with proper doses. This combination I am now using as a local obtundent with good results. I use sterilized water to make the

solution and to prevent possible decomposition make the solution fresh daily or as needed for use. The formula I use is as follows :

R	Cocain,	gr. $\frac{1}{2}$.
	Sulfate of Morphin,	gr. $\frac{1}{8}$.
	Sulfate of Atropin,	gr. $\frac{1}{200}$.
	Sterilized water, gtts.,	xxx.

Mix and inject hypoder. gtts., v to xv.

For convenience I have had the cocain, morphin and atropin made into soluble tablets by Parke, Davis & Co., of Detroit, and in this way solutions of any strength desired may be quickly and accurately made with little or no inconvenience. The sterilized water I use is distilled water containing from 8 to 10 per cent. of listerine or euthymol to keep it sterile. If you desire to make a 2 per cent. solution all that is necessary is to dissolve one of the tablets in twenty-five minims of water. A 1 per cent. solution can be made by dissolving one tablet in twice this quantity of water, or 50 minims. A 4 per cent. solution can be made either by reducing the water one-half or adding another tablet to the 25 minims, etc., etc.

The advantage of this method of making solutions is that you can always have pure, clean solutions and the preparations are portable in small compass. The drugs used in the tablets are the purest that can be had and the firm assure me they are especially careful in filling all such orders. Another advantage is that other correctives or adjuvants may be added to this formula when the solutions are made.

In my opinion the manner of using cocain in dental practice has much to do with the disrepute into which this most valuable drug has fallen. It is an excessively poisonous substance and must be used with the greatest caution and care. There is a tolerably well marked outline beyond which clinical experience has demonstrated one cannot go without hazard. Not more than one-half grain, nor in stronger than 2 per cent. solution, should ever be used at one sitting as a hypodermic injection. It should be used with a clean syringe in perfect order and injected only a little faster than the tissue will absorb it. Excessive pressure on the syringe will cause irritant results and introduce more of the drug than is necessary to produce desired effects. All excess or overflow should be prevented or absorbed before it comes into

contact with the tongue as it will be quickly absorbed by the tongue, or if swallowed produce paralysis of the pharyngeal and laryngeal muscles, and induce dyspnea and develop hysterical symptoms. The best systemic fortifier is coffee or food.

The pharmacology of cocain has received much attention and is pretty well worked out. But it still remains for us to make it a practicable and serviceable remedy. From my personal experience with it I am convinced it is one of the most valuable therapeutic agents and should be in the armamentarium of every dental practitioner and further study is needed to place it in such form that intelligent and progressive men will avail themselves of its many virtues for their own and their patients benefit. This study, it seems to me, ought to be along the line of safe non-secret formulæ.

Some Incompatibilities.*

BY J. S. CASSIDY, M.D., D.D.S., COVINGTON, KY.

FASHIONS in the exhibition of medicines, as in other things, have their periods of change. This fact obtains in the selection of drugs for either local or internal use.

Thus there are many physicians yet living who in their earlier years of practice gave calomel *ad libitum*, to the point of mercurial saturation; it was the distinctive fad in those days, possibly because of a vague idea, an adumbration as it were, of the present accepted theories of bacteriology, that big doses would be destructive to the materials involved in both the causes and consequences of the disease in question.

A few Samsons, as they were called, were regarded as the principal individual "bases" of various combinations, which also usually contained multitudes of auxiliaries and correctives that were pretty sure to "catch the 'coon either comin' or goin'." In these combinations there were too frequent association of decided incompatibles. Now the tendency is to write prescriptions that include but few ingredients. Indeed, it is becoming more and more the style to order only one article, but of recognized utility, a habit due, doubtless, to the many pharmaceutical preparations

* Abstract of a Paper read at Tri-State Dental Meeting, June, 1895.

which have become official, and which, although multiform in their composition, have been given each an individual name, thus simplifying matters very much; so much so that possibly even now, to say nothing of the immediate future, a paper of this sort may be somewhat out of place; and yet man is not and will not be perfect; if he were so, no suggestions would be needed, and no meetings of this kind would be held.

I have known a patient, who successively and repeatedly visited two specialists, during the same half hour; one of them would wash out the antrum and nares with a solution of common salt—a good medicine—and then the other would effectually swab the throat and contiguous parts with a solution of silver nitrate—also a good medicine—neither practitioner being aware of the other application, while the patient received in those parts the questionable service of silver chlorid. Another case, somewhat similar—passive hemorrhage of the gums, treated locally by free application of tannin. In a few hours another doctor applied perchlorid of iron. Enough ink was manufactured by this process to convince doctor No. 2 that a good thing in the wrong place might be worse than a negative quantity. These two homely illustrations are in evidence against the evil tendency of too much subdivision in the field of practice; that although medical men, including dentists, are rapidly adopting mono-pharmacy, the specialists are increasing in number, and inasmuch as each specialist is a law unto himself in regard to his favorite medicines, there must be many cases of a separate and successive reception of incompatibles by the same unfortunate patient. It is well known that when two or more of the major number of soluble salts are mixed together in solution they are prone to exchange their radicals, and thus lose their former identity. Sometimes, however, they are given with this object in view, as, for instance, to obtain in a pleasant way the benefits of potassium citrate, potassium bicarbonate and hydrogen citrate are mixed, and the result secured. There are, of course, exceptions to this rule of salts so suffering mutual decomposition. Equal quantities of sodium chlorid and potassium permanganate in aqueous solution produce an excellent disinfectant and antiseptic wash for either suppurating or simply inflamed surfaces; to these effects the practitioner might wish to add a stimulant; if alcohol, or instance, is the one chosen, it will violate the virtue of the

others, and a dark magma, explosive when dry, will be the principal issue of the union.

Potter says that "catechu and potassium chlorate in a dentifrice, have exploded in the mouth from the friction produced by a dry tooth-brush." We all know of the colorless tincture of iodine, developed by ammonia, which, instead of being what its name indicates, is in point of activity, ammonium iodide, a very dangerous substance. Electrozone, a new disinfectant produced by partial electrolysis of sea-water, is incompatible with the same substances that antagonize Labarraque's solution, its chief active principle being sodium hypochlorite.

Analogous compounds of iodine and bromine are also present, and although in limited quantities, their virtues are not to be overlooked if we wish to receive the full benefits of this new candidate for professional favors, and therefore should be guarded against the many incompatibilities that necessarily affect the good influences of anything, medicinal or otherwise, which lays claim to Uncle Sam's motto of "many in one." A number of authors could be quoted on this subject, and many instances selected from dental and medical journals, to prove that the prescriber is too often forgetful of his duties in this respect; but I wish to make this paper brief, and to mention, merely in the way of a text, only a few examples of those incongruities which have come under my own observation.

Business Education for Professional Men.*

BY C. B. BLACKMARR, D.D.S., JACKSON, MICH.

PROFESSIONAL men usually do everything they have to do in a very unbusinesslike manner. Business education for professional men. Do they need it? I think they do. Whenever you see a successful professional man, you will also notice that all his matters are attended to with promptness and dispatch. One thing I have noticed in my practice is that patients who have the most to do and those who do the most business, are those who keep their appointments the sharpest.

A lazy or slow professional man usually thinks because he

* Abstract of a Paper read at the Tri-State Dental Meeting, June, 1895.

has or takes plenty of time his patients and every one else has.

The law of supply and demand will work just as well in professional work as in any I know of. If a dentist's patients want his services at ten dollars an hour, he has a right to ask it, because his time is worth it. But a man whose time is not worth it has no right to charge it, and his patients will resent it, and his practice in time will show the results of such dishonesty.

A man's patients are usually willing to pay him what that man's time is worth and no more. And just because a recent graduate happens to hear of a certain professor getting \$50 for looking at a tooth is no reason why he should try to get \$50 for consultation fee.

I once heard a successful business man ask a recent graduate this question: "How do you know what to charge a patient when you have finished a filling?" "I don't know," said the graduate. "Don't you have some basis upon which to calculate what your fees should be?" "No, sir," said the graduate. "Can't you charge for your time by the hour or some such way?" "No, sir. But I know of a practitioner who stutters and when asked how much a certain piece of dental work would cost, says f—f—f, and if the patient looks scared, he says *forty*; but if he does not flinch, he says *fifty* dollars, and I guess I will do that way." "All right," said the business man, "but I am glad that I am not obliged to conduct my business on such principles."

I think generally young men, as they are sent to colleges, are impressed with the idea by others that if they only get their professional education, that is all they have to do. So many young men think that their education alone should bring them patients without any further exertion on their part.

I have several young men on my mind now who have not succeeded in their profession, in a financial way at least, owing entirely to their unbusiness-like manner of conducting their practice.

One, for instance, could never be found in his office during the hours stated on his door. Neither was there any word left where he was nor when he would return.

Another young man agreed on his office door to open at 9 A. M. He never was known to keep his agreement. Only a good guesser could tell why. I often wish that that young man would notice whether business places, like banks, etc., opened any more

regularly. If that young man ever made an appointment with a patient, it would usually be to come in some afternoon next week, or if he did actually mention a day and time, he always kept his patient waiting half an hour or so. The patient, of course, not keeping the next appointment so closely.

A man who won't keep his appointments in one thing, won't in others. If he don't keep his office hours, he won't pay his debts when he says he will. A man who is not honest enough to keep appointments will not fill a tooth nor do anything else honestly.

I have gone into professional men's offices during office hours and found the reception room open, vacant and quiet as death. No one to attend to whomever happens in, nor to tell when the professional man would be in.

How long do you think a bank or business place would exist upon such principles?

A professional man suffers proportionately as much. A traveling dental agent once told me that he went into one of the most elegantly furnished dental offices in this State, and waited forty-five minutes without being waited upon by any one. He knew some one was in the laboratory or operating room, because he could hear them talking. Patients came in and would not wait so long, and went away disgusted. That dentist quit practicing on account of lack of patients in a few years.

Patients often blame dentists for not doing good work for them, when the patients themselves are to blame. Dentists often blame their patients as an excuse for not doing good work for them, when the patient would have gladly given the dentist more time and larger fees, if they had known they would have had better work done by so doing.

The dentist and patient are both many times to blame for low grade work. The class of patients a dentist has should decide the class of work he does. If he would like to do another class of work from what he is doing, he must work into that class, letting go the other class gradually.

A professional man, to be financially successful, must please the patients he has, expects to have, or wants to have. He must satisfy them in his promptness, his fees, in his operations, in his appearance, manner, etc. Professional men and their methods are a continual puzzle to the business men. Their basis of profes-

sional fees is a query to them. How a physician or dentist has a right to treat abscesses, tumors, etc., month in and month out, with no apparent benefit, and to charge for the same, is a mystery to business men.

These subjects should be studied out and shown to the young professional men, so they could answer intelligently and in a prompt manner all such questions when asked by their patients, or any one else.

Treatment of the Deciduous Teeth by Means of Crowns and Jackets.*

BY LOUIS OTTOFY, D.D.S., CHICAGO.

. . . It is the dental profession and not the laity who are responsible for the generally accepted idea that children's teeth cannot be filled, or that they should not be filled, and I think it is time the profession remedy the error of which it is the power. The same treatment which will save permanent teeth will not always save deciduous teeth; the conditions are so different that if the operator has not the time or ability, he will meet it by extraction. . . .

As a result of the necessity for frequent refillings, each time causing a little more pain, and cutting away a little more of the tooth and for the purpose of overcoming the many unsanitary and unwholesome practices resorted to, I have conceived the idea of saving the deciduous teeth by means of crowns and jackets.

In the case of incisors and cuspids of children it is difficult, as a rule, to introduce a satisfactory filling especially at so early an age as two or two and a half years. The preparation of the cavities is painful, the teeth are exquisitely sensitive and the most sympathetically disposed operator's patience is sorely tried in doing something satisfactory; hence in the majority of cases the result is a cement filling, often hastily and improperly mixed, hurriedly introduced and perhaps permeated with moisture before a protection against it can be applied. The result is a repetition of the operation in a short time, sorely trying the abilities of endurance of the restless, wriggling piece of humanity, to say

* Abstract of a paper read before the New Jersey Dental Society, August, 1895.

nothing of the increased sensibility occasioned by the repeated cutting away of what little tooth structure there is. How much easier to remove only the greater portion of decay, slightly separate the tooth from its neighbors by means of a sandpaper or other disc, and attach one of these jackets, without taking an impression or carefully fitting it and cementing it into place.

For this purpose I use 22 or 24 k. gold plate 34 gauge, or platinum 38 gauge. The pattern is cut out, bent with pliers, pressed with fingers around the neck of the tooth, and the edges caught with a mite of solder, and cemented into place. The deciduous teeth are usually of a shape readily adapted for the fitting of these crowns. The articulation quickly accommodates itself to the crown, by either the slight displacement of the crowned tooth or of its antagonist. Much of the work is done out of the mouth, and when done at the chair is a source of amusement and interest instead of dread and pain.

I have never taken kindly to the method of filling deciduous teeth by bridging the filling material across the inter-dental space, altho I have been forced to practice it for want of any better means of retaining the fillings in place. In the case of molars, therefore, this practice offers many advantages. Usually it is best to take an impression in wax, modelling compound or Mellott's clay, then with the Mellott's outfit dies and counter-dies are quickly made and a cap struck up. Frequently there is no necessity of shaping the crown, as usually it is unnecessary to extend the cap down on the crown, except for a short distance. It is sufficient if it extends far enough so as to hold it in place. Its purpose is merely to serve as a protection to the underlying cement. It is remarkable with what tenacity these caps will adhere, even in cases where it has been impossible to prevent the moisture from coming in contact with the cement before it has set. For these jackets and half-crowns I find pure gold most satisfactory.

The credit for the mention of this practice is due to Dr. W. W. Shryock, of Ft. Wayne.

Antiseptic Dental Surgery.*

BY A. W. HARLAN, M.D., D.D.S., CHICAGO.

"It is not the normal pulp we are called upon to treat surgically, except in rare instances, but the uncovered pulp, or the pulp which is receding, or the one exposed at the apex of a root, or the pulp which is gradually being transformed into spurious dentine, or one with a fungus growth upon it. . . .

What constitutes true antiseptic surgery of the pulp? First, the understanding of antiseptic surgery. It is no longer surgery which only excludes the causes of putrefaction; we may now include, rather, in the term, all those methods of wound treatment in which the growth and fermentative action of the lower forms of organisms (bacteria) are more or less impeded. Instruments used are to be sterilized by heat or by use of agents which will not fail to destroy all particles from the air or moisture that they are brought in contact with.

My own observations lead me to the conclusion that the pulp to be preserved must be kept from contact with saliva or mixed fluids of the mouth. If water is used upon the surface of a pulp it must be sterilized before such use. Filtration is not sterilization. The water must be boiled, and all instruments to be thoroughly sterilized must be cleaned and afterwards boiled in a sodium carbonate solution, 2 to 3 per cent., or silico-fluoride a saturated solution, 1-144.

The pulp being in a closed cavity, after exposure by disease or intentionally, is to be removed surgically with all necessary precautions, to insure freedom from infection of the pericementum at the apex of a root; the general principal being that no septic matter should be allowed access to a pulp canal after the surgical or mechanical removal of a pulp.

All operations on roots of teeth under the gum and between the tooth root and the alveolar process will be more uniformly successful when they are made with surgically clean instruments. No syringe point should be introduced into the pericementum or the opening that is not surgically clean. Dirt, dried blood, mucus, paste, or any septic matter adhering to a needle will not be ren-

* Abstract of a paper read by title at the American Dental Association, 1895.

dered aseptic by washing in a chemical disinfectant in any strength solution, unless it destroys such substances as fire will, or superheated steam in an oven.

Such dressings as are used in the mouth should be made of gauze impregnated with boracic acid, iodoform or iodine solution. Such dressings should be as dry as possible. . . . Moisture, which is hard to exclude from the mouth and around the jaws, is a *bête noir* for the dentist. It is on this account that the teachings of aseptic surgery cannot be fully utilized in oral operations.

It is the duty of every surgeon to practice antiseptic surgery to the fullest possible extent and to make and keep records of such work to encourage others to do likewise for the benefit of our fellow men."

Report of Section II.*

BY LOUIS OTTOFY, D.D.S., CHICAGO.

At the close of the session of 1894 the total number of dental colleges in active operation and granting degrees was 47. There has been established since that time one dental college, the Dental Department of the University of Omaha, making a total of 48 now in active operation and granting degrees.

Dr. Ottofy then gave statistics regarding the number of students in the schools during the year past. There were matriculated as students of dentistry during the past year 5,277 persons, upon 1,226 of whom the dental degree was conferred. Four years ago, twelve of the thirty-three colleges then existing graduated three-fourths of the entire number. Three years ago, ten colleges graduated 851 students, while the remaining twenty-eight graduated 632. This year six colleges graduated 525, the remaining forty-one, 701.

REPORT ON DENTAL LITERATURE.

The most important work of the year, and the most valuable addition to dental literature in its history, is the Transactions of the World's Columbian Dental Congress, which appeared in December last, in two volumes. There has been a movement for some time to introduce the term "stomatologist" in place of the

* Abstract of report presented at the American Dental Association, Aug., 1895.

word "dentist," and during the past year one periodical dental journal has taken this step and changed its name accordingly.

President's Address.*

BY J. Y. CRAWFORD, M.D., D.D.S., NASHVILLE, TENN.

IN his address Dr. Crawford recommended that the two public addresses at the memorial meeting at Philadelphia, together with a synopsis of what was said at the banquet, be incorporated into the annual proceedings. He suggested that "the old question of representation of dental surgery in the medical corps of the army and navy, demands an earnest and united effort on the part of our profession. . . . That a committee be appointed to investigate the propriety of some inquiry being made in regard to the condition of the mouth and teeth of an individual before obtaining life insurance. . . . Knowing as we do how destructive the diseases of the mouth and teeth are to human comfort, happiness and health, it is passingly strange that no attention has been paid to the subject in conducting a medical examination of an applicant for life insurance." . . .

Regarding dental prophylaxis in the scholastic part of our population, he said: "Our system of education is sacrificing the teeth and health of our people, by putting the child in school at too tender an age. . . . The child should not be put to hard study while he is undergoing the process of tooth-shedding and tooth-eruption." He suggested that the Association ask medical colleges throughout the country to institute special chairs upon the subject of Dental and Oral Surgery, so that medical students will be required to know something of the diseases of the mouth and teeth and the deleterious influence they have in the impairment of the general health.

In his address Dr. Crawford referred to the question of ethics in no uncertain terms. He spoke of the pernicious use of the secular press advertising patent medicines to the world and of the regrettable mistake of some ministers, professors of universities, etc., giving personal testimonials recommending some nostrum the contents of which they know nothing. Further he said: "If

* Abstract of paper read at American Dental Association, Aug., 1895.

the dental surgeons of the United States would unite in demanding the enactment of such laws as would require of all men proposing to engage in the practice of dentistry, an observance of ethical conduct, it would be but a short time before the statute books of all the states would be graced with laws that would annihilate the quack and the mountebank."

He requested, also, that all reputable dental colleges formulate a uniform oath or obligation to which the student should subscribe.

Ought the Formation of Dental Schools be Limited?*

BY C. W. STANTON, D.D.S., BUFFALO, N. Y.

IN the course of his remarks on this important subject, Dr. Stainton stated that the number of physicians practicing in 1895 is about 120,000, an average of one for every 587 of population; that medical schools in 1895 number 156. Number of dentists in the United States in 1895 about 25,000, or one for every 3,134 of population. (He gave numerous comparative tables which we cannot here append for want of space.—ED.) Number of dental schools, 1895, is 48.

Continuing, he said: "What can we deduce from these estimates? That the dental ranks are as full to-day in the United States, in proportion to the demand, as the medical ranks. The over-crowding of our ranks in any locality is prolific in cheap and nasty practitioners, and the lowering of the standard and character of our specialty. The over-production of dentists is not a good thing, either for us or the public." He said we could restrain this somewhat by raising the standard of admission to our dental colleges and lengthening the course of study. "But," he continued, "the multiplication of dental colleges is the chief danger in this direction. . . . Dental schools are not being formed now from any need felt for them as an educational necessity. Two impulses control this matter:

First. Personal ambition to have a position in, and be connected with a dental college, for the prominence it is supposed to give.

Second. A purely commercial spirit on the part of medical

* Abstract of paper read at American Dental Association, Aug., 1895.

schools to have a dental department. Already over 60 per cent. of our schools are appendages to medical schools and medical influences and elements are fostering, more than any and all other influences and elements, the formation of new dental schools."

Regarding the remedy for the formation of new colleges, he said the Faculty Association should serve notice that hereafter no dental school would be accepted under any circumstances unless consent of the Association was first asked and received for its formation. The moral force of 25,000 dentists, yea, of the world, would sustain it in such a movement.

Whither Are We Drifting? *

BY W. C. BARRETT, M.D., D.D.S., BUFFALO.

DR. BARRETT in his paper showed how, from the time of the Revolutionary war, when there was an average of one hundred and seventy-five thousand people for each dentist, there had been a proportionate increase of both population and dentists, until in 1895 it averaged one dentist for every two thousand six hundred of population. "Yet," he said, "the amount of work done by each individual dentist is very much greater than when there was but one practitioner for each 175,000 of the population." . . .

It is true that dentists have greatly multiplied in number, and we constantly hear the wails of pessimists who declare that the colleges are turning out graduates at a rate that must soon make their number more than that of their patients. The prophecies are usually heard from old-time practitioners, who have not broadened their practice with the advance of modern ideas, or kept pace with the progress of professional events. To them the greater part of the dentistry of to-day has no existence, for their horizon has not been pushed back during the last five decades. With their restricted conception of dental practice, it is no wonder that they cannot see where room shall be found for the constantly augmenting number that come thronging through the gates, and they condemn the colleges in no gentle terms for launching such hordes of practitioners into a stream that, to their

* Abstract of paper read at American Dental Association, Aug., 1895.

conception, now seems absolutely turbid with them. They forget that these same colleges are year by year digging that stream deeper and making it wider in a much greater ratio than they are peopling it with occupants."

Further the writer inquired what should be done to get more dentists into our American Dental Associations. He cited the fact that the country was so large that each year some would have to go so far to reach the place of meeting that they staid away. There was an inconstant attendance, in the majority, and therefore acquaintances were not so thoroughly formed. As a remedy, he said it would seem to him that we naturally tend toward four aggregations: one for the east, one for the west and northwest, one for the south and southwest, and one for the trans-montane portions of our common country.

Should Not the Increase of Dental Schools be Restricted?*

BY LOUIS JACK, D.D.S., PHILADELPHIA.

IN this paper the writer referred to the rules passed by the Faculties' Association regarding the requirements of Colleges applying for membership in that body. He said that the tendency to rapid increase of dental schools is shown by the statistics since 1891. In 1893 there were eight unrecognized schools; in 1894, fifteen. Of these, three have been recognized this year, making thirty-one recognized schools, while there are now eighteen unrecognized. The diploma of an unrecognized school has a legal value in the state where the school is located; it gives no *prima facie* right to practice elsewhere without examination by the state board, and in some states the holder would not have the privilege of being examined.

He spoke of the prevailing mania for forming dental schools in connection with medical colleges and pointed out the dangers of over-production that might be brought about unless some restrictions were made. One prominent difference between dental colleges in connection with medical schools and those in universities was that the latter were founded on a broader basis.

Unless some brake is put upon the addition of dental schools

* Abstract of paper read at American Dental Association, Aug., 1895.

which are not of high order, the prejudice against the dental institutions of this country must further increase. The states have no principle which can be exercised to regulate the quantity of schools. We have to depend upon the development of opinion to assist and support such bodies as the Faculty Association or the Dental Examiners in the formulation of such rules as shall guard the interests of all concerned, and to aid in checking the degradation of a profession.

The Relation of Adenoid Vegetations to Irregularities of the Teeth and Associate Parts.*

BY G. F. EAMES, D.D.S., BOSTON.

I invite your attention to a few preliminary statements as indicating my position in relation to the subject of which I am to speak.

1. While mouth-breathing is usually attendant upon adenoid growths, this is not always the case; while, on the other hand, mouth-breathing may exist without the presence of adenoids, or it may be due to a chronic hypertrophy of the turbinated bodies, or some septal deformity.

2. The adenoid growth rarely fills the pharyngeal space so as to obstruct breathing, but mouth-breathing *results* from the irritation which it produces.

3. Mouth-breathing does not produce adenoid vegetations.

4. Mouth-breathing does not cause irregularities of the teeth.

5. I have examined many cases presenting deformed arches and irregular teeth in which no adenoids existed.

It is argued by G. MacDonald that nasal stenosis is a constant factor in post nasal growths, and that this being the case, "as long as respiration is conducted through the nose, there is, of a physical necessity, a diminution in the barometric pressure behind the seat of stenosis. This inevitably results in more or less over-filling of the blood-vessels, which, in its turn, leads to hyper-nutrition and hypertrophy."

I have repeatedly found children breathing through the mouth, and, upon request to breathe through the nose, they have

* Abstract of a paper read before the American Med. Association, Dental Section, May, 1895

been able to do so, but as soon as their attention was drawn in another direction the mouth opened and mouth-breathing was continued. Moreover, the mouth opens so readily, upon so little provocation from the nasal irritation and stenosis, that it does not seem possible that sufficient "diminution of the barometric pressure" can be produced in the pharyngeal vault to cause a growth of tissue.

Again, if this be true, we ask why the growths are so often pedunculated while the pressure is exerted equally in all directions.

This view also necessitates nasal stenosis to begin with; but it is generally understood that the enlarged turbinates are the *result*, not the *cause*, of adenoids, and observation shows that the nasal obstruction gradually disappears after the removal of the growth.

Again, this will not account for the congenital growths, and those in infants whose oral respiration has only been established a few weeks or months; or still again, those cases of nasal stenosis of long standing in which there is no adenoid hypertrophy.

If it is true that this "diminution of barometric pressure" acts also to increase the size of the faucial tonsils, how shall we account for many cases of post-nasal adenoids in which the faucial tonsils are normal? Their growth and development is acknowledged to be on the same principle, they have physiological limitations in common, and it would seem reasonable to assign a cause common to both.

It has been said that adenoid growths in the pharyngeal vault cause irregularities of the teeth. I do not believe this to be the case, but rather that the dental irregularities are only another expression of the same cause that operates to produce the adenoid growth; in other words, there is one cause common to both, yet this cause may not be able in all cases to produce both. The bone developing vital movement may be strong and active by inheritance, while the lymphatic glandular system is weak.

Deformities of the hard palate, forming the dental arch, are frequently associated with adenoid growths, but not always, as many would give us to understand. There are various reasons given concerning the origin of these irregularities. For instance, it is said that a so-called high arch, or V-shaped arch, is a diagnostic sign of adenoids in the pharyngeal vault. The late Dr.

F. H. Hooper, in his pamphlet on "Mechanical Effects of Adenoid Vegetations," says, "The hard palate, from the constant atmospheric pressure within the mouth, is pushed upward." It is difficult to see how there can be a constant pressure within the mouth while it is open and the air is free to move either in or out. The air must be confined in a given space, and a force exerted, in order that pressure in any given direction be made. Therefore we cannot believe that this deformity of the arch is due to atmospheric pressure caused by nasal stenosis.

The theory of David accounts for the deformity of the hard palate, in persons suffering from nasal stenosis, by a partial vacuum produced in the nasal cavities and upper pharynx by the act of swallowing. The atmospheric pressure remaining the same in the mouth, its roof is pushed upward. It is difficult, also, to reconcile this theory with the writer's view of the case. In the first place, it must be a rare case in which the nasal stenosis is so perfect that a partial vacuum should be produced behind it. Of course, it is well known that, in the act of swallowing, the tongue presses forcibly against the roof of the mouth from before backward; the soft palate is slightly raised; as the bolus of food, if any, passes it, the posterior pillars of the soft palate then contract on each side of the uvula, forming a nearly perfect valve, which, with the application of the posterior wall of the pharynx to the superior surface of the soft palate, forms a successful barrier, protecting the posterior nares.

The necessity of this, as well as proof of this function, is shown in cases of paralysis of the soft palate, in which liquids swallowed regurgitate into the nose. Now, the act of swallowing is momentary, and the muscles contract firmly, and it does not seem possible for this temporary diaphragm to be so pulled downward as to cause a partial vacuum in the nasal cavities; moreover, immediately after swallowing there is a reaction; the breath being held during deglutition, it is expelled with some force through the nose or into the nasal cavities, the mouth being closed in the act of swallowing. If the air does not find exit through the nose, the mouth does not open until after considerable pressure has been exerted in the upper pharynx and the nose. This may be demonstrated by occluding the nostrils with the thumb and finger, and performing the act of deglutition.

Again, if deformities of the hard palate are caused by the

withdrawal of atmospheric pressure on one side, and maintaining it on the other, it would seem that as the pressure bears on all parts equally, the palatal arch should be pressed up equally high in all directions. This is not the case always; for example, Model 1 shows the case of Mr. C., aged about thirty-nine years, with a large adenoid growth in the pharyngeal vault, but one side of the hard palate is much higher than the other side.

It has been stated that mouth-breathing necessitates a constant dropping of the lower jaw, which, in so doing, causes pressure of the masseter and other muscles upon the buccal surfaces of the upper teeth and consequent flattening of the lateral alveolar arches, and the projecting forward of the cuspids and incisors.

I cannot believe that the dropping of the lower jaw produces pressure on the teeth in the superior maxilla. The lower jaw is approximated to the upper teeth principally by the masseter, temporal, and internal pterygoid muscles, and when the jaw drops by the relaxation of these muscles, and with it other muscles and tissues of the face, unless the mouth be opened to the fullest extent by action of the platysma myoides, digastric, and other muscles, the tissues of the cheek are not put upon the stretch; in fact, the finger can be easily passed in between the teeth and jaw, without being sensible of any pressure upon it, provided the mouth is not opened widely. Moreover, it seems reasonable to conclude that the jaw is held suspended, not by the cheeks, but by the masseter and accessory muscles.

The cheeks cover the jaws and teeth loosely, with tissue to spare, and will, as a rule, admit of the jaws being opened to a considerable extent without separating the lips or stretching the cheeks, which is the case during sleep; therefore when the lower jaw relaxes sufficiently to let the air in through the mouth, it cannot put the tissues of the cheeks on the stretch, or draw them tightly against the teeth. Both observation and experiment will show that it is only necessary to open the lips slightly, in order to allow sufficient air to pass in by the mouth, and that all the tissues and muscles concerned are *in a relaxed and flabby condition while mouth-breathing is going on*. In order to demonstrate this, I have made a number of experiments, to determine the pressure of tissues and muscles against the teeth. The device which I have found most successful will explain itself.

The use of this apparatus confirms my views as above expressed. Moreover, the anatomy of the parts involved bears the same testimony upon careful observation and study. Notice the fact that a straight line drawn from point of origin to insertion of these muscles would not touch the teeth. A profile view shows the fact that the masseter extends no farther forward than the second molar, while the other muscles concerned do not come as far forward as this.

Bazin is quoted as advancing the idea that the weight of the tongue in the floor of the mouth would tend to expand the lower jaw beyond its normal limits. I would suggest, however, that if weight is the expanding force, how can it press laterally, since gravity would carry the tongue downward into the floor of the mouth, which would rather draw the sides of the jaw together than otherwise. But if it be the muscular force of the tongue, then it is easier to see how the teeth might be pushed outward.

But here is a case, Model 2, Mrs. H., aged thirty, with a history of mouth-breathing from infancy, with a marked contraction of the lower jaw, the bicuspid closing entirely inside their would-be antagonists. The nasal breathing is fairly free at the present time, yet mouth-breathing is continued, partly from habit, and partly from a mild chronic nasal catarrh. There are no adenoid growths or enlarged tonsils; there may have been in early life; but the one thing to be noted is, the habitual mouth-breathing did not expand the lower teeth in this case.

Dr. Henri Chatellier, of Paris, calls attention to the bones of the head and face consequent upon obstructed nasal respiration. He points out that the air cavities, as the frontal, sphenoidal, ethmoidal, and maxillary sinuses, being normally in communication with the air, cease to develop when the circulation of air through the nose is interfered with, and hence dimensions of the face are altered.

Dr. Talbot says, "There are many cases of contracted arches where mouth-breathing does not exist; there are also many cases of normal arches where it is present." I have cases, seen by a number of competent witnesses, to show that the above statement is entirely correct.

I now wish to present two cases, both having marked adenoid growths and consequent nasal stenosis and mouth-breathing, but the dental arches present a striking contrast, Models 3 and 4.

Model 3 represents J. H., aged thirteen years, upon whom I operated November 4, 1893, removing a large quantity of adenoid tissue. In this case there was defective speech, the usual dullness and deafness. After the operation, the first improvement was shown in the hearing in two weeks; the speech was slightly better in four weeks; and the nasal stenosis is decidedly lessened. The marked feature in this case is the broad and regular dental arch.

The other case, E. F., Model 4, aged nine years, was operated upon a week later. The symptoms were about the same as in the case just described, with the exception that there was very little deafness.

Marked adenoid growths are sure to produce mouth-breathing and more or less nasal stenosis; but irregularities of the teeth and deformities of the arch are not at all certain to follow as a consequence, but are rather companions, due to a common cause.

Dr. Talbot further says that in most cases the cause of these deformities is an arrest of development of the bones of the nose, and this produces mouth-breathing. While there may be an arrest of development of the bones of the nose, I would call attention to the fact that the opposite condition exists as to the turbinated bodies, which are hypertrophied.

Resolutions Passed by the American Dental Association at the Last Meeting.

(1.) That this association believes the conferring of honorary degrees in dentistry to be detrimental to the profession of dentistry, and hereby expresses its disapprobation of the practice.

(2.) That this association formally adopts the Army Medical Museum and Library as the National Museum and Library of the dental profession of the United States.

(3.) That a committee of five be appointed by the chair to co-operate with the Army Medical Museum and Library Managers in enriching its stores of dental literature and museum specimens, especially by appealing to dental societies and individual members of the dental profession for material assistance.

The committee appointed consists of Drs. Wm. Donnally, Washington, D. C.; J. Taft, Cincinnati, O.; H. J. McKellops,

St. Louis, Mo.; Frank Abbott, New York City; and Henry W. Morgan, Nashville, Tenn.

(4.) That the American Dental Association condemns the use of secret preparations known as "local anesthetics," as well as all other secret preparations.

(5.) That it is the sense of this association that the National Association of Dental Faculties can largely control the formation of dental colleges by passing a resolution refusing to admit any college to their association of which the organizers did not first apply and obtain permission from the National Association of Dental Faculties to organize such institutions.

(6.) That at the session of the American Dental Association to be held in 1896, the general sessions shall be held every morning and at such other times as may at the pleasure of the association be designated;

That the sections shall be required to hold separate meetings simultaneously during the day, and that all papers pertaining to the sections shall be read and discussed in the sections;

That at the *general sessions*, one hour each session shall be devoted to the president's address, the general addresses prepared by appointment, and such other papers as embrace the results of original investigations as may be recommended by the appropriate section;

That at the general sessions reports embracing only a syllabus shall be made of the papers which shall have been accepted at the individual sections, these reports to be presented by the representative of said section: meaning hereby that the work must be done in the sections;

That all papers which have been accepted by the several sections shall be published in the transactions of the association, with the discussions thereon.

CORRESPONDENCE.

DEAR DOCTOR:—I have read with much pleasure Dr. Haskell's "Reminiscences of Past Dental Life,"* and I desire to respond

* Published in the May issue OHIO DENTAL JOURNAL.

to a part of them. I went, when a boy of seventeen years, as a student of dentistry in the year 1847, in the office of Dr. Wm. S. Monefeldt, Charleston, S. C. I do not know what was his idea, but he kept me carving teeth out of ivory and instructing me how to fit pieces of ivory to a plaster model by the aid of gouges and India ink, such as is now practiced by the Chinese and Japanese, although gold plate work was known and practiced as it is now. Nevertheless, he kept me at this work. I made all the dies and counter-dies which the other workman used to swage the plates on. In the year 1849 the first fair of the South Carolina Institute for the Advancement of Mechanical Art was held. At that fair I presented a specimen of carving in ivory. It represented an entire set of teeth carved from a solid block of ivory, for which I received a medal. At this fair Dr. I. A. Cleveland—a dentist—presented specimens of beautifully artificial plate of gold with gum and plain teeth, which had the central air chamber. “The Cleveland” chamber takes its name from him. Dr. Cleveland claimed the invention of this central air chamber, but though he received a medal for “beautifully executed workmanship,” the Board of Directors refused to give him a medal for the invention of the central air chamber. The cause of this refusal was due to this—the wife of one of the members of the board had sought the services of my friend, Dr. I. B. Patrick, who had made her, *several years previously*, a set of teeth on gold plate with the central air or suction chamber. He was induced to resort to this from this circumstance. There was a French invention of air chamber (some of these I remember seeing myself in our laboratory), which was practiced by placing the cells along the alveolar ridge. These cells were of oval shape, being about a quarter of an inch wide by one-half an inch long, and were placed on the ridge, two in the vicinity of the first molars and one at the median line. I never saw more than three used. The lady who had sought the services of Dr. Patrick had her mouth filled with roots, so that these French chambers were impracticable in her case, and she was so averse to the extraction of them yet so anxious to have a set of teeth that Dr. Patrick endeavored to satisfy her. He said to himself, “why can I not place this chamber in the roof of the mouth as well as on the ridge?” He told her he would experiment on her plate, but did not know if it would succeed. He then made the plate with the

central air-chamber and to his great surprise it adhered firmly. This circumstance being known to the member of the board as having been practiced for his wife, led to the refusal of the claim of Dr. Cleveland, but through motives of delicacy Dr. Patrick never pushed or claimed the invention which he could not do without calling in the testimony of the lady for whom he did this work. I have written to Dr. Patrick to ask relative to the date of the above, but he is only able to say that it was a few years before (probably *three*) the first fair of the South Carolina Institute; and this having been held in 1849, makes the date of his first use of the central air-chamber about the year 1846, so that if your preceptor made them in 1844 he antedates Dr. Patrick.

I recall the visit of Dr. John Allen's agent when my preceptor purchased a right for continuous gum work from him. His name, I think, was McIlvane, but the cases we did never proved successful. The porcelain body and enamel cracked and peeled from the platinum plate.

It is pleasant to recall these doings of the past and I am sure that your contemporaries have enjoyed your reminiscences.

Truly yours,

THEODORE F. CHUPEIN.

Philadelphia, Pa.

ALL SORTS.

Cleaning Teeth.

Mix the pumice with a solution of castile soap, instead of pure water. It cleans easier, leaving a smooth finish.—*Jour. Brit. Dent. Association.*

Substitute for Gutta-Percha.

According to the *Revue de Thérapeutique*, a substitute for gutta-percha may be prepared as follows: Tar, 1 part; paraffin, 10 parts; dissolve together at 120 degrees, then add caoutchouc, 2 parts. Keep at this temperature until a homogeneous mass results.

A Case of Masking.

Dr. F. F. Drew read a paper on the subject, before the Union Meeting in Baltimore, which appears in the *Dental Cosmos*. In substance it is as follows :

"In 1893 Miss A., aged eighteen, called to consult me regarding a case of irregularity. It was one we all know as a case of excessive protrusion of the inferior maxilla. The disfigurement was so great that the young lady had become morbid on the subject, and at the earnest solicitation of her friends she, two years before I saw her, applied to a dentist to have the deformity corrected by the use of appliances. She was under treatment for two years, at a cost to her of eight hundred dollars, without benefit. In giving me a history of the case, she said that in childhood she met with an accident in which the inferior maxilla was fractured. A surgeon was summoned, who reduced the fracture, but improperly, and this was followed by ankylosis, which produced a permanent disfigurement. After hearing her story I came to the conclusion that it would be impossible to successfully correct the deformity by ordinary methods, and with the experience of the other dentist before me I concluded not to try. I decided to adopt the following method.

I took an impression, in plaster, of the upper jaw. A model was obtained, and from the model a die and counter-die in metal. A platinum plate, 27 gauge, was then swaged to cover the space on the die representing the surface from cuspid to cuspid, running it up as high as the frænum, extending over the laterals and centrals, and lapping over their cutting-edges, the part lapping over being punched with holes and roughened.

The plate was then placed upon the model, and four plain plate incisors of the right size and color were arranged to articulate correctly with the lower natural teeth and soldered to the platinum plate. This was then transferred to the plaster model and waxed extensions made back to the second bicuspid, gold clasps being fitted to the first bicuspid. The whole appliance was then flaked and vulcanized, the surface of the rubber being covered with *pink* rubber, as I was afraid it might show when she laughed, and the pink would be more in color-harmony with the mucous membrane. After finishing the rubber part of the fixture, everything was completed but the addition of gum in front. For this purpose I barbed the surface of the platinum around the teeth, and pressed celluloid around them, the surface being stippled to imitate mucous membrane. The appliance was then transferred to the mouth and telescoped accurately over the four natural incisors, completely masking them, the celluloid blending nicely with the natural gum. The

front teeth articulated correctly with the lower, and enabled the young lady to prehend properly, something she found it impossible to do before.

The improvement in her appearance was correspondingly very great, and she was naturally elated at the change which had been accomplished without any pain to her,—quite a contrast to what she had gone through with two years before. She was of course directed to remove the plate frequently, so that the natural teeth could be thoroughly cleaned in order to prevent decay.”

Alcohol by Synthesis.

Chemists have known that ethylic alcohol can be made artificially, and with such exactness that it cannot be detected from alcohol made by natural processes. The alcohols of commerce are governed by a breaking down process, from a complex to a simple, by transforming starch or sugar through the aid of yeast and fermentation. Building up alcohol synthetically from carbon, hydrogen, and oxygen, is a new phase that promises great revolutions in many directions of science and art.

The recent discovery of Mr. Wilson, of acetylene gas from lime and coal dust treated with electricity from carbon electrodes, has made it possible to produce ethyl alcohol so cheap that all other processes will be abandoned. Organic chemistry has been leading in many fields of commerce, and the question of building up products in demand, cheaper than they can be made by natural processes, is answered affirmatively by the constantly increasing substances on the market. Fruit flavors, colors, and sugars and many other products are made far cheaper and of equal value to the same substances as produced by nature.

Foods of various kinds are now made in the laboratory, and chemists have asserted that not far away beefsteak will be built up and furnished to the masses. The possibility of doing artificially or chemically what is now done by nature, seems to be limited only by a want of sufficient knowledge and control of natural forces. Should Wilson's discovery of cheap acetylene prove to be what is expected, ethyl alcohol will be made for 2 or 3 cents a gallon or less.—*Journal Amer. Med. Association*

Cardiac Stimulation.

The application of heat over the heart, and application of hot and cold water to the spine in rapid alternation, are a much more effective means of arousing the heart to activity than the administration of alcohol.—*Modern Medicine.*

Which Method of Root Canal Filling Will Completely Obliterate Space?

A paper on this subject was read before the New York Odontological Society, by Dr. S. G. Perry. From this and the discussions printed in the *International Dental Journal* we abstract the following:

Dr. S. G. Perry.—"The methods I employ for the most part require openings to be made through the teeth directly over the roots in a line with their long axis, so that their canals can be entered with nearly straight instruments. . . .

The end of a piece of gold wire, smaller than the diameter of the canal to be filled, is bent over on itself with the pliers, and crimped to a uniform size in a fine groove in the beaks of the pliers. The length of the portion bent over is not more than the diameter of an ordinary pin. This is done in order to get a better hold of the wire if it ever needs to be removed from the root. In attempting to pull it out, if it does not come, but straightens out, there is then wire enough to get hold of with suitably made pliers. This doubled end of the wire is then fastened in a delicate pin-vise made for the purpose.

The depth of the canal having been measured by slipping on the Swiss broach one of the little rubber disks cut from the rubber dam by the Ainsworth punch, the wire is cut to the right length, and then, being firmly held by the pin-vise, is filed square to a tapering point by a very fine file. On this wire a half-dozen or a dozen fibres of silk or cotton are rolled exactly as is done on the Swiss broach. This is then transferred from the pin-vise to a plugger-point, into the end of which a hole is drilled; large enough to receive the doubled end of the gold wire. The fit is close enough to hold, and yet so loose that, when the gold wire has been put to its place in the root, the plugger slips off and leaves it in place.

This gold wire, while held in the plugger-point, is dipped in chloro-percha or oxychlorid of zinc and put at once to its place in the root, the canal having just been swabbed with a cotton-wrapped Swiss broach, wet with a very thin solution of the chloro-percha or the oxychlorid, as the case may be. When this gold wire is carried to its place it is certain that the root is filled to its extremity as perfectly as it may ever be. The plugger is of soft steel, so that, in a moment, it can be bent at any angle.

In this manner it is possible to fill these canals through a comparatively small tap-hole. This operation requires nice manipulation (there is none in dentistry that requires nicer); but it can be done, and exactly as described here."

Dr. E. C. Kirk.—Fill the desiccated canal with melted paraffin and

pack in a gutta-percha cone of proper size and shape, avoiding excess of paraffin.

Dr. A. W. Harlan.—There are three substances which may be used to obliterate canal space,—wax, gutta-percha, and paraffin. All are unalterable in the root of a tooth, all comparatively easy to introduce. Not one of these materials will absorb moisture or deteriorate in its presence in such a place as a root. The roots must be dried and a solvent used to liquefy gutta-percha, wax, or paraffin. After a portion of the liquefied substance is introduced, a larger, more solid piece, attenuated or pointed, may be packed directly into the roots until they are completely filled. Force, combined with gentle heat, will be sufficient to pack the roots full of either material. I prefer gutta-percha. Teeth will not be stained by deterioration of the filling-material, and no permanent soreness will ensue in case a small quantity is forced through the apex. It will exfoliate or become encysted.

Dr. C. N. Peirce.—Without doubt in my mind, gutta-percha, when properly applied or inserted, makes the most complete root-filling; but it is only mechanically so; as you know, it has no therapeutic influence. With zinc chlorid or some other good antiseptic in advance of it, it probably cannot be excelled. Salol I have used with great satisfaction, but experience with it is of too recent a date to say what of the future.

Dr. Guilford.—Large experience and length of time have, I think, about decided that for ease of introduction, perfect filling of the space, non-shrinkage and unchangeableness, together with its aseptic qualities, oxychlorid of zinc heads the list of materials suitable for root-canal filling.

Dr. L. D. Shepard.—I judge you want the methods which each uses, and not theorizing. For very many years I have used the red gutta-percha, which I roll into a fine and long cone. This may be two inches long, and tapering from one-sixteenth to one thirty-second of an inch at its greatest diameter to a point. Working some chloroform into the canal, I take the cone in a pair of delicate forceps, hold it a moment or so in chloroform, so that the outside is softened or partially dissolved, and then press the cone, *cold*, into the canal. This cone, while soft and sticky on the outside, is, as a whole, stiff, elastic, and yielding, and, I am quite sure, “obliterates the space.”

Dr. John S. Marshall.—In my judgment, chloro-percha and gutta-percha points most perfectly obliterate this space.

Dr. McQuillan.—I consider, where care is used not to force the material through the apical foramen, that the oxychlorid of zinc is the very best for filling the canal.

Dr. J. B. Littig.—The best method of root-canal filling is the one

wherein we place in the root-canal a few fibres of cotton, twisted on a smooth broach and saturated with oxychlorid of zinc.

Dr. J. Y. Crawford.—I believe the very best results in filling root-canals can be accomplished by thoroughly drying, and, when exudates have ceased from the apical region, trim a small, fine needle of orange or some other wood made sterile by proper treatment, and around the tiny end of which roll a small quantity of Abbey's soft gold-foil, and then tap it into the apical third of the canal, after which the remaining portion of the canal can be filled with any of the reputable root-fillings desired, except tin, lead, and amalgam. The objections to the tin, lead, and amalgam are that they are factors in the discoloration of pulpless teeth when placed in the roots. I believe by this means that space in the canals can be most effectually obliterated.

Dr. G. V. Black.—Gutta-percha cones, not started into the canal with pliers and a hit-or-miss effect made to force them home, but stuck onto the end of a properly-shaped root-canal plugger, the size having been ascertained by trial, and sent to place with certainty. The canal is to be well moistened with oil of eucalyptus first. Canals too small for this are done the best I can with gutta-percha dissolved in chloroform, but this only when I cannot do better.

Dr. J. N. Crouse.—I would recommend the following method: Put some oxychlorid of zinc at the entrance of the root-canal; then wrap one or two thicknesses of No. 10 gold around the end of a broach, dip it in oxychlorid of zinc, and push it carefully into the end of the canal, using it as a medium to carry the oxychlorid. The gold should be lapped loosely around the end of the broach, so that when it is carried into the root-canal the broach can be removed, leaving the gold and oxychlorid of zinc at the end of the canal. Gold can be carried in this way to the end of the smallest canals; and by taking a watch-maker's pivot broach and drawing the temper just enough to get the blue color, you have a spring temper which I think makes the best instrument for filling in this manner. If the gold is carefully wrapped around the broach, and the oxychlorid is carried ahead of it, the canal is thoroughly filled and all the air is excluded. This practice has given me the best results, and I cannot remember when I have had trouble with a root which was filled in this way.

Dr. R. R. Andrews.—I do not know which method furnishes the most complete obliteration of space in root-canal filling. My simple method works well: after cavities are prepared, I use chloroform, then liquid gutta-percha, then gutta-percha points, then heat with hot air, and pack solidly.

Dr. J. Taft.—It is well, after the preparation of the canal, that it

should be closed at the end of the root as nearly as practicable; then form a cone-shaped piece of lead, or even a fine-grained piece of wood saturated in some antiseptic fluid; carbolic acid or creosote would serve the purpose. These should be made as nearly as possible of the same shape as the canal, so that upon being pressed in it would fill it, without, however, great pressure. When this cone-shaped lead or wood is prepared, it may be coated upon the surface with oxyphosphate of zinc, and then pressed firmly or driven lightly into the cavity, cutting off any portion that may protrude from the canal or pulp-chamber. By this method not only would the space be completely occupied, but the open ends of the tubuli would be filled. Of course, other materials than lead or wood may be used, as gold, silver, copper, or tin. None of these are better than lead or wood. By this method the canal will be absolutely filled.

Dr. J. Truman.—I hold that there is nothing superior to chlorid of zinc, for it will, as far as known, quite effectually fill the canals and coagulate all dead material in the dentinal tubes.

Dr. Ives.—For the last ten months I have discarded everything in root filling for the following: First, accurate measurement of the root-canal; second, the use of a copper wire; third, the preparation of pure beeswax in a water-bath, to which is added any anti-septic you use,—iodoform, if you wish. I take a thread of the beeswax, and with a spatula roll it down to an absolute point. This, fastened onto the end of a nerve-instrument I pass up as far as possible. With an Evans root-dryer, heated, I drive the wax into the tubuli, adding wax till the canal is full, then with my heated copper point, which protrudes slightly into the pulp-chamber, I send it right to the end. I know that every part of that root-canal is absolutely filled. What space there is between the side and the copper point is filled with the beeswax. Beeswax does not expand nor shrink, and it is not affected by acids or alkalies. I have had great success with it, and have discarded everything else for it."

At the last meeting of the Illinois State Dental Society the subject of root-canal filling was discussed and we insert here some of the remarks as they appear in the *Dental Review*:

Dr. W. N. Morrison.—To return to the point as an aid to get the chloro-percha or the liquid substance that you wish to carry to the apical region thoroughly and keep it there after it has been thoroughly dried, as one of the previous speakers remarked the canal must be dried and free from moisture, as well as from the air bubbles, then using any of the materials that you wish to lodge there. I generally use gold points, but I have lately used pure silver points of wire drawn to different sizes, fitted and adjusted them in the manner that I have demonstrated before this society many times; I feel as though the younger men somehow do not

understand this. They still use a gutta-percha point cut off and attempt to fit it there by pushing it to the point with an instrument or forcing it up by guess work. To my mind it is purely guess work, and I cannot see how it is thorough and accurate. I have no hesitation in recommending pure silver points. You carry them on the original wire of silver and it is very pliable and easily adjusted to the region in which it is to remain. Pure gold I have used for many years in the same way.

Dr. G. V. Black.—If any of you fill root canals in the mouth without the dam under ordinary circumstances among saliva, etc., you will get into trouble, and if you should go into court you will find that expert evidence will be against you, and you will lose your case.

Dr. Edmund Noyes.—Make a minute cone of Hill's stopping, having previously moistened the canal with eucalyptol. The less eucalyptol you have in the root the better, if it moistens the walls of the canal; then fasten an exceedingly minute cone of Hill's stopping upon the end of the instrument. Warm the Hill's stopping over the flame enough to make it plastic, and the instrument, to keep it so, then touch the little cone in the eucalyptol bottle which will make it exceedingly plastic, then carry it into the fine canal, work it up out of sight, push it forward until the delicate sensation in manipulation indicates to you that it is gone to the end. Take another piece and proceed in the same manner, do so patiently until the canal is full, and you will know whether you have filled the small canal of the root.

Dr. Matteson.—My method is to cut it into square strips lengthwise, the way in which it has been rolled, that would make a square rod, then holding it over the lamp or flame gently twist and draw it. You can draw it down to the fineness of a hair and as it is twisted it forms a cone screw. This can be cut off in sufficient lengths such as you will want, one-quarter of an inch, heat the end of the broach and catch on the end the gutta-percha point and carry it to its place. The difference between that and soft white gutta-percha is that the latter will invariably curl up, and this will do it if you are not rapid. It can be carried up into the cavity and the screw allows the surplus to flow back and another cone is then pressed to its place and the softened part is returned toward the opening."

Concentrated Boric-Acid Solutions.

By heating boric acid to 47 degrees C. with gelatin, a mass is obtained which contains 68 per cent. of boric acid. This emulsion dissolves in water with great facility and consequently a boric-acid solution may be prepared of any strength.—*Nat. Druggist.*

A Crown in Thirty Minutes.

In an article in the *Items*, Dr. De Witt Barker says:

"At the April meeting of the Second District Dental Society of New York, Dr. F. T. Van Woert showed a new 'hurry' crown, and demonstrated that a perfect fitting crown could be made and placed in the mouth in less than thirty minutes. A Logan pin is first fitted to the root and the protruding end split, and the ends bent down close to the end of the root, forming a T-shaped pin; with the pin in the root an impression is taken, the pin withdrawn from the root and replaced in the in the impression and a plaster model obtained with the pin in place; a plain rubber tooth is ground to fit, placed on the model and held with the fingers while fusible metal is poured or fused with a hot spatula on the palatine surface, and filling up the space between the pins and end of the root; while the metal is still soft, a piece of chamois is placed over it and quickly pressed with the thumb. The completed crown is removed from the plaster, surplus metal filed off and polished on the lathe, and it is ready for setting.

Dr. Van Woert does not put this forward as a permanent crown but merely as a temporary affair, but the fit is so good and the attachment so strong it seems as durable as some more elaborate crowns.

In my own practice some variation of details have been found advantageous. It will be observed that there is no union between the fusible metal and the pins—it merely flows around them as vulcanite rubber does. I use a German silver pin with a piece of German silver plate soldered across the end like the head of a tack; the pins in both root and tooth are touched with a saturated solution of zinc in hydrochloric acid, and then when the fusible metal is poured, it solders itself solidly to both. After the German silver pin is filed to fit the root, it is cut off one-quarter inch from the root, this extra length is a convenience in placing the pin in the impression and can be cut off after the model is obtained."

A New Hemostatic.

Hedderich contributes to the *Munchener med. Wochenschrift* an account of a new and powerful hemostatic which he calls ferripyrine. It is a double salt of chlorid of iron and antipyrin, an orange-red powder, easily soluble, and is used in solutions of a strength of 18 or 30 per cent. It can, however, be used as a powder. Caustic action has not been noticed even after prolonged contact with the mucous membrane of the nose. It will stop hemorrhages from very vascular growths.

An Annoying Operation to Successfully Perform,

Says Dr. H. O. Logue, in the *Items*, is filling a lower wisdom tooth that cannot, for half a minute at a time, be kept free of saliva. Such a case presented in a young lady, of highly nervous temperament, whose flow of saliva was excessive. Placing of the dam was impracticable, and napkins placed in the mouth would almost immediately become saturated. This annoyance was overcome through the action of sulfate of atropin, a dose of which ($\frac{1}{120}$ grain) I had her take three-quarters of an hour before her next appointment. At that time I found the mouth very dry, though not uncomfortably so for the patient. This salt of atropin has a much better effect on the secretion than the ordinary alkaloid. Its manifestation lasts from four to five hours.

Beaded or Grooved Vulcanite Dentures.

In the *Dental Cosmos* Dr. W. Storer How says:

“By scraping a groove across the palatal portion of the plaster model and along the buccal and labial lines of muscle attachments, to form a bead-inclosure will produce a supplemental chamber-like function of nearly the entire inner surface of the denture.

The result is a greatly increased retaining hold of the plate on the gums, especially noticeable in cases having flat and soft surfaces.

Partial dentures may thus be securely retained, and the simplicity of the process is hardly less remarkable than the successful result. It is only essential that the scraper shall be shaped and operated to produce a suitably smooth, narrow, half-round groove in the model, and follow previously studied lines along the palatal soft parts and at the merging of the muscles in the gums. The inclosures may be of any size or shape or number that a careful pre-observation of the character and conformation of the mouth may indicate. If experience proves that the beading is too prominent at any point, ready relief may be obtained by smoothly reducing the projection at that point; but first allow time for the settling of the denture before taking off portions of the bead. In most cases, no ‘chamber’ will be required other than the beaded inclosure, and this is a matter of considerable importance when a shallow vault and short teeth make a thin plate necessary for the proper production of speech.

In some instances, an alternative cutting of grooves in the vulcanized plate, may be indicated, and that can readily be done with a round or oval engine bur, taking great care to smooth the edges of the grooves. These are especially effective in lower dentures, which may thus be given

a really adhesive hold in cases otherwise most difficult of retention. When grooves are employed, strict cleanliness must be earnestly enjoined, else the foul grooves will become a source of irritation, a defect not incident to properly formed beads.

An example of duplicate and triplicate bead-inclosures is shown in the plaster model, which exhibits a shallow vault having a hard anterior center with depressions on either side of the hard center. The bead lines follow the soft borders of those depressions. A further reinforcement of the retaining function is effected by a posterior bead-inclosure just within the junction of the soft with the hard palate, as previously shown. The denture thus constructed will be found to be very securely retained.

If for any reason a 'chamber' is deemed desirable, it can easily be made, after vulcanization, by deepening the bead-inclosure with an engine bur."

Trichloracetic Acid in Treatment.

In an article in the *Dental Cosmos*, Dr. J. A. Stackhouse, after stating the properties of trichloracetic acid cites the following cases in which it was successfully employed :

"I might cite two or three cases of my own that may be of interest to those of us who have not yet used this treatment. The first, a lady, thirty-seven years old, although she had nearly all the teeth, intended by nature, suffered from that condition so often met with in patients between the ages of thirty-five and fifty years, of sponginess of gums and irritation, caused by a ring of tartar very closely adherent to the tooth-structure, just below the margin of the gum on each tooth, with a decided suppurating pocket palatally on the superior left incisor, one each on the superior right second bicuspid, first molar of the opposite side ; teeth inclined to more than ordinary looseness, and generally unclean and in an unkept condition.

After the free use of chisels and scalers and tincture of iodine, for cleaning the coronal surfaces of all teeth, I began the treatment of the gum-tissues, cleansing with peroxid of hydrogen in my hypodermic syringe, passing the needle 'gently' as far under the gums as possible without causing soreness to the patient, repeating this two or three times in as many days, so as to have the surroundings in the desired aseptic condition. I then used trichloracetic acid on cotton, twisted on a root canal cleanser, made of piano-wire, using it as before in the pockets and gum-margins, taking one-half of either arch each time, the treatment thus taking about three weeks' time.

I am gratified to say her teeth, after being repaired by fillings, etc.,

are in a perfectly healthy and normal condition, as solid and clean as I believe it is possible to make them.

Another case, a gentleman, aged seventy-two, full lower natural denture, with six superior anterior teeth. The superior left cuspid root was partly denuded of gum and covered with serumal tartar, again closely adherent to the tooth; the gum was congested, and pus was being exuded from its labial and distal surfaces (the palatal surface being healthy and free from any abnormal condition). After removing all tartar, I proceeded as above, with peroxid of hydrogen, until I got the flow of pus under control. This took me three weeks, for the breaking-down process was very persistent; then upon the same probe I made two applications of the acid inside of a week, and in a few days the arched festoon of gum surrounding the cuspid was healthy and normal."

An Improvised Mandrel.

Get a few "fourpenny" wire nails at the hardware store, select one with symmetrical head and carefully straighten any curves in it on your anvil; then warm in alcohol or Bunsen burner flame, and apply a small quantity of gum shellac, or what is better, some of the "Ideal Base Plate" to the face of the head and attach your corundum wheel, point, or polishing cup or disk (previously warmed), turning it gently between thumb and finger, and truing it up while still warm. After it has hardened, smooth off with warm wax spatula. If the nail head be too large for the point you are to mount, file it down to the required size. This size nail just fits the S. S. W. No. 7 Handpiece, and the flat face enables one to mount a wheel easily and truly. Oxyphosphate may be used, and perhaps makes a stronger mounting than the others, though not so quickly applied.—*J. E. Waterbury in Items.*

To Remove Nitrate of Silver Stains.

Hahn recommends the following mixture for this purpose: bichlorid of mercury, chlorate of ammonia, each 5 grams; distilled water, 40 grams. The stains are touched with a piece of cloth dipped in this mixture, and then rubbed. The spots, even if of long standing, disappear almost instantly, on woollens, cotton or linen. Stains on the skin may be removed by the same method. They first assume a yellowish-white color and then completely disappear.—*Le Semine Medicale.*

An Interesting Case in Practice.

In the *Atlanta Dental Journal* Dr. R. B. Adair cites the following case :

“ On the 9th of July last, a child, four years old, was brought to me for treatment. Upon examination of the mouth I found a great mass of jelly-like substance protruding from the gums and alveoli on each side of the upper gum extending from the canine teeth back and around the second molars. It was so large that it filled up the buccal cavity and protruded over the grinding surfaces of the molars to such an extent that mastication was impossible, and any attempt to masticate food would simply lacerate the tumors and produce profuse hemorrhage. The child, who a few weeks before was healthy and active, had become through the lack of proper mastication, digestion and assimilation and prevented nutrition, weak and emaciated, all of which resulted in softening of the bones and loss of locomotion. She had not walked a step in several weeks and could not stand alone; every effort to masticate would fill the mouth with blood and cause intense pain. I prescribed a soothing lotion and requested them to return the next day thinking that I would post up a little before forming my diagnosis and method of operation. In vain I searched everything I could get from the physicians; I could find nothing to fit the case. I decided to operate at once, which I did, by applying a local anæsthetic to the gums. And with a sharp bistuary I excised the tumor from each side. When detached it slid out of her mouth into the spittoon like a heavy piece of jelly and profuse hemorrhage followed, which was very difficult to arrest. I then examined the alveolar process and found the bone entirely gone down about half way to apex of root of molar tooth. With a spoon-shaped spade excavator I scraped out all dead bone from around the necks of the teeth affected and after washing out with Peroxid of Hydrogen, using Dunn's Syringe, and applied my Big Nigger Treatment for Rigg's diseases, and turned her over to a physician for constitutional treatment. The parents decided to take the child to Mt. Airy, for a few days to get the benefit of the invigorating mountain breezes, but returned in a few days with worse conditions than before. The hypertrophy of the gums was greater than when operated at first. I operated same as before and found that the excrescence would develop in one night just like a mushroom. I tried nitrate of silver and many of the caustic remedies and found that every thing that was caustic or escharotic added fuel to the flame, so to speak. I then tried soothing anodynes with no benefit. I then decided to extract the two molar teeth on the right side and scrape all the alveolar process down to the sound bone. This had no effect toward stopping the development

of the tumors, so I saw that it was a mistake I made in extracting the teeth and decided after bursting tumor to syringe out the parts thoroughly with peroxid of hydrogen, using Dunn's syringe, then drying off parts and applying Big Nigger every morning. I saw that I had hit on the right treatment, and the case made a rapid recovery, and we dismissed her well on the 15th of September. I will explain that my Big Nigger treatment (so named on account of its being so black) is crystal iodine, dissolved in beech creosote saturated solution, as thick as it can be made, and then a tannate of glycerin. The iodine preparation was applied first after drying the parts with old broken Donaldson nerve broach previously wrapped with absorbent cotton and when absorbed the glycerole of tannin was flowed over that in same way. I have thus at length described the case because of its rarity and because I could find nothing in any of our text books, that would fit the case. I have no name for it."

The Metric System.

Some time ago we drew attention to the disadvantages which wholesale manufacturers were subject to in their business relationship with the Continent. Although receiving orders for goods in quantities according to the Metric System, they were warned that it was illegal to execute them in this fashion. A Select Committee has been enquiring into the subject, and as a result, recommends that the Metric System shall be at once legalized, that it shall be taught in all public schools, and at the end of two years be made compulsory.—*British Journal*.

Method of Repairing Rubber Plates.

Dr. A. B. Crawford gives his method in the *Dental Digest*, as follows:

"Warm some wax and lay on a flat surface, then put parts together, teeth down, and press lightly into the wax. It is then easy to see if the parts come together correctly. Run full of plaster and, if a lower plate, put a stiff wire, bent to fit, into the plaster to stiffen it. When plaster is hard, remove from the wax bed and scrape away the old rubber from a quarter of an inch back of the break down to an edge at the break, then varnish with rubber varnish and let it stand at least two hours to dry. Then press on new rubber with a warm instrument, invest, vulcanize, and finish. By this method undercuts will cause no trouble."

What is the Surest Treatment to secure Root-Canal Sterilization ?

This subject was discussed at a meeting of the N. Y. Odontological Society. From the report in the *International Dental Journal*, we condense the remarks made in the discussion and present a gist of them as follows:

“ *Dr. Darby* answered the question by stating that he used sulfuric acid and hot air (bicarbonate of soda after the acid). ”

Dr. Louis Jack.—The most important consideration is not to force the infectious matter contained in the canal through the foramen, and to avoid the use of infected instruments. I consider it safer to oxidize the contents of the canals with permanganate of potash, by inserting a small crystal, and permit it to decompose the organic matter present, and afterwards to carefully cleanse the canals, following with aristol and oleum gaultheriæ in cases where pus is not present.

Should pyæmic conditions exist, my reliance is upon zinc chlorid, five to ten grains to one drachm of water, or formalin five-per-cent. solution, in all cases following with aristol as before.

I am careful to avoid the use of irritating medication, and believe better results follow the above line of treatment than when more active remedies are employed, such as pure carbolic acid and corrosive sublimate.

Dr. E. C. Kirk.—By the application of (1) a saturated solution of sodium peroxid, and (2) twenty-five per cent. pyrozone.

Dr. A. W. Harlan.—Repeated washings of the root-canal, first, with neutral peroxid of hydrogen or pyrozone; second, with cinnamon-water or peppermint-water. Dry the interior and introduce a strand of silk or cotton wet with myrtol; seal this in the cavity for one or two days with gutta-percha. After this is taken out, do not let saliva or water get into the root. Fill it.

Dr. C. N. Peirce.—For thoroughness in removing all decomposing organic matter there is nothing which goes to work with a determination to clean out everything which is impure as does the sodium peroxid. I have no hesitation in putting a minimum portion of this in the root, and covering it over with gutta-percha, let it revel for twenty-four hours; then I wash it out with dilute sulfuric acid.

Dr. S. H. Guilford.—Root-canal sterilization can, I think, be best secured by first removing with a drill (where possible) a portion of the most infected dentine bordering the canal, and then subjecting the remaining portion of the dentine to the action of same sterilizing medication that will be rapid in its action, efficient, and non-injurious to tooth-structure.

Mercuric bichlorid, while it stands first in the list of germicides in laboratory experiments, has fallen far short in its efficiency in actual practice. Carbolic acid has produced better results at the hands of the majority of practitioners than many other agents with a higher laboratory record; while iodoform, which Professor Miller claims is not a germicide at all, has in the hands of the writer produced better results as a root sterilizer than any drug he has ever used.

Dr. John S. Marshall.—First, thoroughly remove all pulp debris by broaches wrapped with fibres of cotton. Second, disinfect with ninety-five per cent, carbolic acid and dry the canal. Third, flood the canal with absolute alcohol and evaporate with hot air until thorough desiccation is obtained. I succeed best by these means. The rubber dam is indispensable in all cases.

Dr. McQuillan.—In treatment of infected canals I have had the best results from the use of sodium and potassium, followed with twenty-five per cent. pyrozone, three per cent., and thoroughly drying with hot air.

Dr. Littig.—Thoroughly cleansing and drying. The kind of drug employed makes but little difference as to whether it is a coagulant or not.

Dr. Crawford.—The surest treatment to effect root sterilization is first to isolate the tooth by the use of rubber dam; dry the cavity and as much of the canal as possible before proceeding to cleanse the same of foreign contents; in the first explorations be certain to avoid too much pumping with medicated swabs. Use bichlorid of mercury not stronger than one to three thousand to frequently wipe out the canal during the operative procedure, so as to keep sterilizing all the newly-infected particles that may occur. When the canal is thoroughly cleansed and made perfectly dry, close it up for a few minutes with a dry tampon of cotton to give the last wiping of bichlorid of mercury time to act upon any bacilli or micro-organisms that may be present. If it is desirable to test the condition of asepsis thus produced, I would recommend the thorough packing of the canal with cotton saturated well with pure German beechwood creosote, as this is the best antiferment that has ever been placed in the canal of a pulpless tooth. In addition, it certainly has some anodyne effect upon the peridental membrane when it is coincidentally involved as a result of a septic condition of the contents of the pulp-canal.

Dr. Black.—Pack with oil of cassia or some mixture containing it in sufficient proportion, not less than one-sixth. The 1, 2, 3 mixture is my standard. Close the cavity perfectly with gutta-percha,—no cotton or gum,—moistening the walls with eucalyptus first, and let it remain one week. Put on the dam before beginning and before removal at the end of time.

Dr. Crouse.—I generally use this method: when the pulp has been dead some time and the tooth needs sterilizing, I use what I think is called Black's 1, 2, 3 compound, composed of one part carbolic acid, two parts oil of cinnamon, and three parts oil of wintergreen. Oil of cinnamon will sterilize any tooth quickly, but should not be used for the front teeth, as it frequently turns them yellow. For teeth in the front of the mouth I use bichlorid of mercury, or carbolic acid, or both; the bichlorid first, and then the acid. After applying arsenic I generally remove the pulp in two or three days. This can be readily done by wrapping a little cotton around a small, smooth broach, forcing it into the canal, and twisting the broach slowly, when the pulp will usually cling to the cotton and thus be removed entire. After this I fill immediately, using the above-named medicine before putting in the oxychlorid of zinc filling.

Dr. Truman.—The agents used may be briefly stated to be,—

1. Those that act on organic matter,—hydrogen dioxid or pyrozone; or the alkalies, as sodium peroxid; or a combination of the escharotics and alkalies, as the process recommended by Dr. Callahan of sulfuric acid and bicarbonate of soda. These are practically cleansers, while in a degree they are antiseptic.

2. Follow with one of the following antiseptics proper: mercuric chlorid, hydrouaphthol, thymol, creolin. The latter I regard as one of the best antiseptic cleansers we have in use. Used in full strength with cotton to wipe out the canal, it is most effective. If this has been carefully done, the canal should be dried by the warm-air-blast. This, in my judgment, is the proper treatment of the canal, and will place it in the best possible condition for subsequent filling, if the minute microscopical cells are not to be considered. If these are regarded of vital importance, as unquestionably they are, then the filling as recommended in answer to question first, oxychlorid of zinc, must, in my opinion, be adopted, as I place no reliance in the lasting effect of any of the essential oils.

Dr. Taft.—With a desiccated exudate through the canal, simply cleanse by manipulation and wash with warm water or some simple dilution; then, after drying the canal, some antiseptic agent may be employed.

Sulfuric acid treatment, brought prominently to the notice of the profession within the last two years by Dr. J. R. Callahan, is in very many cases of pulpless canals an excellent treatment. By its introduction it facilitates the removal of all *débris*. It also acts upon the walls of the canal, dissolving from the surface more or less according to the strength and amount of the acid used, thus enlarging the canal instead of with an instrument. After the employment of this mode of treatment

no further sterilizing agents need be used. Every organism reached by the acid would be effectually destroyed.

Dr. Hart.—I have had least trouble with carbolic acid.

Dr. Hill.—After treating diseased roots of teeth where there have been abscesses, there is always trouble in such cases, and you want to get to the end of the root. I clean out a root with five or six fibres of cotton on a broach, allowing the cotton to extend one-half to three-quarters of an inch onto the broach; then I turn it right around the broach until I have a perfect screw made of cotton. Make it small or large, but work into the end of the root until you have it very small, and you can get every particle of foreign matter out of the root.

Where there is an abscess on the root I always pump 40% sulfuric acid through. If the processes are diseased at all, it will hasten the death or dissolve what is there."

A New Method of Artificial Respiration.

The *Gazette medicale de Paris* for August 10th contains an abstract of an article on a method of inducing respiration by Dr. Berthold Beer, which appeared in the *Wiener medicinische Blatter*. The method consists in the employment of ice as follows: The mucous membrane of the lips and of the mouth is rubbed slowly with a piece of ice, the rhythm of the motion corresponding as much as possible to that of normal respiration very strong at first, but, with the continued application of the ice, becoming very regular, quiet, and deep. The ice used in this way is said to have, moreover, a general sedative effect, and the author has employed this quieting action with success in the treatment of cerebral troubles. Dr. Foges, of Vienna, has obtained equally favorable results with this treatment in two cases of asphyxia. In all cases it is a method that may be employed for several hours at a time, as it is harmless for the patient and easy for the physician. It also offers other advantages owing to its sedative action.

To Prevent Porcelain Teeth Becoming Loose in Partial Vulcanite Work.

When making plates where the teeth are scattered we often find one or more porcelain teeth quite loose, owing to the contraction of the vulcanite. To prevent this, bend the pinheads from each other, forming a wedge. To prevent pinheads showing through finished plate bend them down towards face of model.—*C. Boston, Pac. Coast Dentist.*

Amalgam and How to Manipulate It.

Dr. A. C. Hewitt, in the *Items* says :

“ The cavity should be prepared as conscientiously as for gold filling, sterilized and dessiccated. To aid in doing the latter readily the following may be used as dentinal desiccant :

R. — Alcohol (pure)	fl. 3 v.
Chloroform	fl. 3 iij.
Beta Naphthol	grs. v.

M. Apply to floor of the cavity thoroughly and evaporate with warm or heated air.

Not only should salivary moisture be removed, but that lying in the tubules, the dentinal plasmasomes, and the unctionous film along broken enamel rods. I lay stress on this part of the work, for if moisture lies back of the imposed plastic, especially if the alloy contains copper, there will be oxidation and precipitation of salts to blacken tooth substance and invite influx of oral fluids.

Unless we realize how difficult it is to bar moisture from any place, we will underestimate the need of the care advised. Next, the surfaces to be covered in by the amalgam should be coated with some resinous solution for two purposes. First, to bar moisture, and second to form a sticky base in and on which to grind particles of the alloy. For this purpose the following is what I have used with gratifying success :

R. — Sandarach varnish,	
Damar varnish	aa fl. 3 j.
Alcohol (absolute)	fl. 3 j.
Beta naphthol	gr. v.

M. Apply as a varnish.

When the liquids have evaporated, leaving the resins as a lining for the cavity, the dentine and enamel should receive another coating, this time of amalgam burnished on to the varnish with a smooth-point amalgam plugger, flat-faced or “ shot ” pointed, till the cavity floor and walls take on a mirror-like surface. By thus burnishing the amalgam on the walls, every tubule and enamel interstice will be filled and brightened over.

The amalgam for this first coating may be well saturated with mercury, but only sufficient of the moist mass was left to form a thin coating, all surplus possible being ‘ poked ’ or burnished out of the cavity. From thence on, amalgam wrung through heavy muslin or chamois only is to be used ; one layer after another burnished on to the preceding one, each added mass being as dry as can be and cohering to the preceding one. If free mercury is thus brought to the surface of the plug, it should be

'poked' or burnished out before another dry mass is added. Keep the growing mass dry. Thus build till the cavity is 'rounding full,' care having been taken that every undercut, fissure, nook and corner is densely filled, not with free mercury, but with the alloy. When the cavity is more than full, 'rounded over' like a bushel of potatoes in a basket, coax the surplus mercury to the highest point by gentle pats or tapping with the plugger, and while thus atop, absorb it (free mercury) with tin foil No. 4, rolled into balls, or what is better, 'bricks' of Watt's crystal gold No. 2, freshly annealed within a lamp flame. When the free mercury is thus disposed of, the surplus amalgam is to be burnished down to a proper level with a hand-shot point or a steel 'Herbst' point in an engine hand piece, rapidly driven, moving the instrument from the center toward and over the enamel borders. Thus the line of free mercury, always tending to cling to enamel border, will be taken up and carried off by the dryer surplus portion of the filling. Before removing the dam, varnish the plug. In mixing the amalgam, the bare palm of the hand and the bare finger should never be used. Enough oil and moisture, from a bare palm, can be worked out to saturate an ordinary sized mass for a filling. Dry the cavity; keep it dry. Prepare the Amalgams free from oils and water; pack densely; absorb surplus mercury. At a future sitting, polish the filling. If good alloy is used and this care is taken in the manipulating, but few workers will live long enough to see the need of a repair.

Of course, some cavities can only be filled 'submarine.' Then try gutta-percha till above high-water mark."

One Cause of Failure.

In his article in the *Dental Digest* on "Suggestions on Developing and Conducting a Dental Practice on Business Principles," Dr. J. N. Crouse says:—

"Another cause for the failure of the young operator may be that he has been confining himself too closely to his office, and has neither associated with his fellow practitioners in their society work nor read the instructive part of the journals. When these two things are omitted from a man's professional life his growth is sure to be dwarfed, and he is an extraordinary individual who can attain even average success if he neglects to reap the advantages gained from such helps as dental societies and journals. We know of nothing that could compensate for these with a dentist."

Influence of Manipulation and Packing of Amalgam.

In his contribution to the *Dental Cosmos*, Dr. G. V. Black says:

" . . . The important feature of the effects of manipulation in the packing of amalgams is produced by the breaking up and kneading the mass into plasticity with the instrument. If it is forcibly ground up and softened with the instrument, it is caused to contract. It does not seem to make much difference how this is done, whether by rubbing with a burnisher or by thrust after thrust with a flat point. It is in vain that we dry out the excess of mercury by pressure or by absorbents; it will contract if the proportion of silver is less than sixty per cent. Fillings must be condensed at any cost, and the material must be forced into all parts of the cavity. Any plan of manipulation that fails in these points is of no value in filling teeth.

Pressure, however severe, that condenses the mass without kneading, it tends to prevent shrinkage; and any of the amalgams can be made to expand in setting, even those that with ordinary manipulation contract the most, by using sufficient pressure that actually compresses the mass without breaking it up. This is illustrated in the fourth filling of formula No. 10, an alloy that is found to contract badly with the ordinary modes of manipulation, probably for the reason that it is cut excessively fine. This particular filling expanded. It was made in this wise: A steel point of a heavy dynamometer was made to fit loosely into the cavity of the steel tube to be filled. The cavity was partly filled, but loosely, with amalgam, and this steel point, cushioned with a piece of semi-soft rubber, was placed upon it and a stress of five hundred pounds turned on and maintained for ten minutes. Then another layer of amalgam was put in and compressed in the same way. This was continued until the cavity was full. This filling has expanded nearly as much as other fillings from this alloy have contracted. The mercury expressed in making this filling was carefully weighed and deducted, so that the percentage given in the exhibit is that actually remaining in the exhibit is that actually remaining in the completed filling.

The third filling of formula No. 5—another alloy that contracts badly—was put in by thrusts of two hundred pounds each with a steel point one-fourth inch in diameter used in the phagodynamometer illustrated in the June issue of the *Dental Cosmos*, substituting these special points instead of the teeth. This filling has also expanded. It was intended to collect the mercury expressed in making this filling and deduct it from the percentage in the mass as prepared, but unfortunately some of it was lost.

The third filling from formula No. 4 was made by hand-pressure,

using all the power I was able to exert, and very carefully cutting out with a sharp instrument and discarding all material that softened under the instrument,—*i. e.*, all material that became kneaded to softness was discarded entirely, not dried out and condensed. This filling has shown no contraction whatever, but expanded slightly at the usual time of the secondary change (expansion) occurring in other fillings made from this alloy. The margins of this filling have remained perfect. In making the fillings from formula No. 19, the softened material was also *cut out* and discarded. Their margins are good.

While these experiments illustrate the effects of manipulation, they give little hope that, in general operations upon the natural teeth, contraction can be prevented in those alloys containing less than sixty per cent. of silver.

Packing Amalgams.—In the observation of the margins of the fillings of this series, irregularities in the parting at the margins were frequently noticed, and especially was this prominent in fillings made from preparations not wrung out. In several experiments undertaken for the purpose, it became clear that when the material was properly prepared, these irregularities, resulted from irregularities in the packing. This was shown by marking certain points along the margins of tubes and depending on squeezing the amalgam up to the walls at such points by pressure in the neighborhood instead of packing it directly. In this way I found that I was able to produce gaps of shrinkage of extra width in fillings that seemed perfect when finished. It strikes me that this is an important point in the packing of amalgam that is not realized by the profession. It seems to be required that every portion of the material be subjected to the direct pressure of the instrument, in order that it may not shrink in hardening. This has been very noticeable in these large fillings made entirely with broad points. I found that to avoid gaps appearing, I had to go around the margins very closely and carefully. In practice this should be done with a smaller instrument, used frequently, but not with such force as to break up the integrity of the partially packed material,—*i. e.*, the instrument should be used often in such a way as to compress, not to cut into, the material.

The influence on shrinkage of cutting out all softened material with a sharp, spoon-shaped instrument is so notable that it recommends itself for very careful consideration. Although previous studies had in some degree prepared me for this, it was nevertheless a great surprise, and, after careful studies of it in the few cases in which it was tried in the series of fillings presented, others were made, the observation of which could only extend a few days, to see if the findings would be confirmed. The effects of the procedure have been obvious in every case. Pack a

layer of amalgam thoroughly and then go over it with a sharp, spoon-shaped instrument and remove material until only firm, hard surface remains. Then add and condense more material and repeat the removal of softened portions, repeating this until the cavity is more than full, and then finish down.

Clinical observation of amalgam fillings leads to the inference that chemically the material stands fairly well in the mouth, the objections to it being confined almost entirely to its variations in color and its discoloration of the teeth. There is abundant clinical observation that goes to show that discoloration of the substance of the tooth does not occur if the margins are tight. It is only the leaky amalgam filling that discolors the tooth. The feature that strongly condemns amalgam as a filling-material has been the difficulty of making tight margins and maintaining them. This difficulty is inherent in the physical characters of the material, and the nature of these difficulties has now, in some degree been pointed out. If these studies, together with others in this line which may follow from other sources, will enable us to form plans of procedure applicable to general dental work that will secure and maintain perfect margins with the silver-tin amalgams, this material must take a much higher rank in dental operations than it has deserved up to this date."

Antiseptic Mouth-Wash.

Dr. F. G. Novy recommends as an antiseptic mouth-wash:

R	Saccharin,	.	.	.	.	.	2.5	grams.
	Benzoic acid,	.	.	.	.	.	3.0	"
	Absolute Alcohol,	.	.	.	.	.	100.0	"
	Oil of Peppermint,	.	.	.	.	.	0.5	"
	Oil of Cinnamon,	.	.	.	.	.	0.5	"

Sig.—Dilute with nine parts of water and hold in mouth one minute.

Absorbable Animal Tissue for Covering Wounds.

J. Lustok has patented a process in Germany under which the muscular coating of the intestines of animals is divested of both the interior and exterior layers of mucous membrane, and then digested in a pepsin solution until the muscular fibers are half digested. This is then treated with tannin and gallic acid. The result is a tissue which can take the place of the natural skin, and which, when laid on the wound, is entirely absorbed during the healing process.

Pyorrhea Alveolaris.

At the Union meeting at Baltimore, Dr. B. F. Arrington presented a paper on this subject in which he states that "pyorrhea, like any other disease, is amenable to treatment, and can be cured; and when cured, will remain so, if instructions as to care, cleanliness, free use of the brush, etc., are carefully observed." From an abstract printed in the *Dental Cosmos* we quote as follows:

"There is no justification for so much talk about the disease not being curable. Such ideas are extremely absurd, should and must be discarded, and all must treat for cure, and the results will prove convincing and satisfactory. What one man in the profession can do, others can, on the same line of procedure, if they will. I have not, nor do I presume to say, that the line of treatment I pursue, alone, will always cure the disease, but I do say emphatically it will cure nineteen times in twenty. I have experimented considerably with various remedies recommended, but have never obtained as good results as with the remedies and treatment I will name and recommend in the interest of humanity.

The first step in treatment is to test the strength of the teeth in their sockets, and if any are to be extracted (all should be that cannot be made comparatively firm in socket) extract before commencing to remove deposits. Thoroughness in the removal of deposits is all-important in treatment, and to secure perfect success *smooth-edge scalers* must be used, such as I send for careful inspection, five of a set of ten I use, points varying in shape and size. Of the five, with those marked one, two, and three, I remove at least nineteen-twentieths of all deposits. You perceive the edges are smooth and can do no injury to surface of root, alveolar process, or soft tissues surrounding. To lacerate the gingival border (entire) and produce new action, if possible, is important for cure. The removal of deposits prevents continuation of the disease, but does not prevent return of it. Soft tissues below and away from gingival border should be preserved as free from injury as possible, also the alveolar process, which is never in fault and has no part in the disease but to suffer loss, and is often seriously affected as the effect of a cause always originating in the gum border, which increases by degrees and creates the cause of alveolar trouble. Remove the cause and the effect will abate, and the alveolus will speedily take on healthy action, always will if deposits are thoroughly removed and *sulfuric acid* is generously applied. The practice advocated by some to chisel, scrape, and bur away the alveolar process (any portion of it) is absurd. Sulfuric acid properly applied is better for weakened and softened alveolus than chisels, burs, and scrapers.

I have never chiseled and scraped the process in treatment of the disease more than two or three times, and then it was not imperative for cure. When you think the last vestige of deposit has been removed, probe carefully again and again to make sure of completeness. In some extreme cases it requires from two to three hours' persistent effort for removal of deposits. When this has been accomplished, then with brush of proper size (small) and shaped to suit, brush heroically with diluted C. P. sulfuric acid and pulverized pumice (not finest), varying according to age and extent of disease, from one of acid to ten, fifteen, or twenty of water. Make it a point, universally, to fret and lacerate the margin of gum with brush and pumice, with a view to new and healthy action. Do not fear injury to surface of teeth from effect of the acid. No injury ever does or can result. As evidence of the slight effect upon enamel or cementum, I send for inspection a tooth which was kept in a mixture of one of acid to ten of water for twenty-four hours.

Much good and no harm can come of the free use of sulfuric acid in treatment of the disease. It is seldom necessary to apply it more than one time for cure. After the use of brush, acid, and pumice, press the gums well with finger, then apply to the gums freely campho-phenique (full strength), and instruct the patient to use a brush, the same as was used in the treatment, forcibly and systematically, several times daily for a week or two, specially after meals and before retiring at night, and to follow the brushing with finger-pressure until the gums are healthy and firm. Advise the patient to return to the office the next day after treatment, or the day following, and for several days for careful inspection, probing and removal of any particles of deposit that may be detected, and to see if instructions as to brush and finger-pressure are respected.

Some patients will neglect to carry out instructions, if not watched and encouraged to persevere. It is important in treatment and really essential to use the brush forcibly, and fret the gingival border to bleeding if possible, for several days after removal of deposits. Applications of campho-phenique (full strength) to the gums two or three times daily for several days will prove beneficial. In the incipient stage of the disease, before the granular deposits are formed around the necks of the teeth, the free use of acid and pumice with brush is all that is requisite to check and obliterate the disease. It is at that stage as truly pyorrhea as in more advanced stages, when there are deep pus-pockets, cake deposits on roots, and teeth loosened to loss. It commences as pyorrhea, progresses and ends as pyorrhea, is pyorrhea all the way through from commencement to cure or final loss of teeth. One line of treatment is requisite for cure,—*viz*, that above stated. If faithfully tried and persevered in, good results will always be realized. In cases as we meet with them, cure can be effected in from five to ten or fifteen days."

Some Original Methods in Bridge-Work.

In an essay read before the Georgia State Dental Society and published in the *Atlanta Dental Journal*, Dr. W. G. Browne, gives his methods as follows:

“There are some objections to certain forms of bridge-work which this attempts to overcome. The Low Bridge, which does not touch the gum does not always meet the demand for cleanliness—for we find the so-called self-cleansing space on the side of bridge next to the gums at times very unclean. If porcelain fronts are used we must exhibit gold at the cutting edge of the teeth if we would protect them from breakage—and even that does not always do so. Next the difficulty of repairs when one of these fronts is broken.

I present three forms of bridge-work and methods of attachment:

Case 1st is a case in the mouth of Dr. M. N. Mixon, of Rome, Ga., now present, of the four incisors. English tube teeth are used or any other of similar shape; they should be shaped like the natural teeth—less in size next the gum—so that, when it is placed in socket prepared for it, it should wedge home—in other words, it should become more firmly fixed as pressure is made upon the cutting edge. The tooth should be accurately fitted with a band which extends around it, and just beyond its longest diameter, leaving its front exposed. Now each tooth being so fitted and the abutments in position, assemble them on the model or in the mouth and remove the teeth from the investment and solder the bands together. Strengthen on back and front with solder.

You will observe that solder being flowed in between the bands make them unyielding and thus prevents displacement of tooth by outward pressure, and the only gold exhibited is at these points and looks very much like gold fillings. This form of bridge-work is not so well adapted to short bites for the front teeth, but is applicable to long bites and in bicuspid or molars. When the exhibition of gold is not objectionable, the band may extend entirely around the teeth. I have another method and practical case present which I present to your notice, three lower incisors and two molars. The teeth are those which are commonly used in continuous gum work—they have one pin which is bent down parallel with the root of the tooth and a band is made in similar manner to the preceding and after being fitted another piece of gold is laid across the band embracing the pin and soldered (which you will remember is parallel with the tooth), thus forming a socket for it—these are then assembled in position and soldered after removing the teeth from their sockets. It will be seen that each tooth is accurately fitted to the gums and when finally placed and cemented, they should rest firmly

thereon—each tooth stands at the gum isolated from the others as do the natural teeth so that they can easily be cleaned by passing a thread between it and the gum—but it cannot become very unclean.

Your attention is called to the plan used for making the Molars in Case II—they are made by taking a thick molar tooth used on gold plates and grinding to saddle the ridge and then surrounding it with a band which is soldered to the abutments and the tooth cemented in place. Sulphur may be used to fasten these teeth on the bands before they are inserted as well as in the other form presented.

Another device presented is that of two bicuspid made in manner as Case I, but with the additional plan for attaching the bridge without cutting the natural teeth. It will be seen that the bands are fitted on a metallic model to the teeth used for abutments and the ends meeting on the side next to the space to be bridged—then continued beyond to the back of the artificial teeth, and into which a screw thread is cut. Now, when the tooth and bridge are all made and adjusted ready for insertion, put the cement or gutta-percha in bands and on the teeth and screw home. Of course the head of the screw must be cone-shaped so that the end of it will not project and thus interfere with the insertion of the tooth which is then inserted and forced close down onto the gum and held in position by either cement or gutta-percha. We still find people who refuse to have their teeth cut and this plan meets the demand in their cases. It serves another good purpose by leaving the ends of the molars, or other abutments exposed, and thereby not exhibiting so much gold."

Dental Caries.

Dr. C. J. Essig says: "Neither from the prophylactic nor therapeutic standpoints has dental caries been sufficiently studied as a disease. Dentists have been so engrossed in the artistic treatment of the teeth and the development of mechanical appliances that a rational systemic treatment has been almost entirely overlooked. Caries of the teeth may with as much propriety be considered a disease as is "Bright's" or any other lesion affecting the different organs of the body, yet any of these may be controlled or cured by medicinal or hygienic treatment.

A properly regulated diet, with systematic physical exercise for the purpose of promoting assimilation to the extent demanded by nature for a normal condition of all the organs of the body, would do much to control and even cure dental caries. Many of our young patients have really no physiological right to have teeth, so perverted are the nutritive functions of their bodies. Does it not then seem that a more rational

treatment would consist in a hygienic system which would so build up the tooth-structure that it would be capable of retaining the mechanical stopping over which we spend so much time, skill, and patience, and that would reduce the chances of a recurrence of caries to a minimum?"—*Extract Dental Cosmos.*

Size of Drops.

F. Eschbaum has directed his attention to the wellknown differences existing in the size of drops of various liquids from tubes of uniform size. The factor which determines the size of the drop is the outside diameter of the tube, not the size of its aperture. Eschbaum has compiled a table showing the relative weights of drops of various medicinal agents, and recommends physicians either to make themselves familiar with such a table, or better to prescribe solutions by weight instead of drops; in the latter case the pharmacist could indicate on the label the number of drops to be taken. Thus, a solution containing say, morphin, could be ordered in doses of 1 gm.; the pharmacist could direct it to be taken in an equivalent number of drops, in this instance 10.—*Phar. Jour.*

A Case in Practice.

Dr. Jeffries relates the following interesting case in the *International Dental Journal*:

"I would like to speak of a gentleman who had suffered for about eighteen months with neuralgia. He had been to his dentist a number of times and had his teeth examined to find out, if possible, the cause. In this emergency the upper wisdom tooth on the painful side had been taken out. That was the history when he came to see me if I might give him relief. There were no cavities or dead teeth on the affected side, but a broken root of the extracted wisdom-tooth remained which I removed.

In sounding the bottom of the old socket I detected the crown of a tooth opposite the posterior buccal root of the second molar, I endeavored for half an hour to extract it without losing the second molar. Finding this impossible, I took out the second molar, and then without difficulty extracted a second wisdom-tooth that was lying on its side with the crown surface pressing against the roots of the second molar. The gentleman was cured of his neuralgia."

Malignant Disease of the Peridental Membrane.

An interesting contribution by Dr. A. H. Smith appears in the *Lancet*. He says:

During the course of some recent investigations in the subject of the patho-histology of the peridental membrane, I found among my specimens several marked examples of a new growth intimately associated with and springing from the fibrous periosteum of the teeth—a condition which seems to have escaped the attention of the writers of surgical and dental text-books. These periosteal tumors present on examination appearances which warrant more than a passing notice and afford a subject of great interest and importance to general and dental surgeons alike.

The chief points of interest in connection with these peridental tumors are that they are found in connection with the roots of sound teeth, and that their characteristics are those of round-celled sarcomata.

1. *Seats of occurrence*.—The growth is confined, as its *locus principii*, to the periosteum of the molar teeth, the maxillary being much oftener affected than the mandibular series. It is generally seen to rise from a point situated at the junction of the roots with the body of the tooth.

2. *Microscopical appearances*.—The tumors vary in size from that of a split pea to a small nut, and have a smooth, convoluted, rarely ragged surface. They are firm to the touch and are of a deep red color. The teeth themselves are non-carious and exhibit in their hard parts no traces of disease except slight attrition of their cusps and (in some cases) absorption of the apices of the roots. They are markedly loose, and signs of chronic inflammation of the periosteum accompanied by an accumulation of tartar, are often noticed.

3. The *etiology* of the disease is obscure; but there seems to be a predisposition on the part of the growths to attack the fibrous membrane of the teeth of females about the period of the menopause. Long-continued and powerful friction, as shown by the wearing down of the cusps, is probably the exciting cause.

4. The *subjective symptoms* point chiefly to long-continued sharp pain, increased on pressure, the course of the disease lasting sometimes several months. The pain is excruciating at times, and such as to render necessary immediate extraction of the loosened organ.

5. *Objective symptoms*.—On examining the mouth, at first there is sometimes almost entire absence of swelling or of any usual inflammatory signs, and the tissues are not markedly indurated. There may be slight suppuration. If the disease is not far advanced diagnosis is only complete after removal of the tooth. Later, well-marked symptoms of malignancy appear.

6. *Microscopical appearances.*—The growths consist of masses of cells held together by a fine network of fibrous tissue which is very dense here or very loose there, and is in some places apparently undergoing fibrification or chondrification. In the centre of the growth this network is scanty, but the intercellular tissue is conspicuous outside. Vessels are scanty in the centre and have extremely thin walls, they ramify among the cells. In the outer portion they are larger (but not dilated) and have normal walls. The cells themselves are for the most part rounded in shape and considerably larger than red blood-corpuscles. They contain one or more nuclei and are devoid of any definite cell wall. Great numbers of spindle cells exist. There is little hemorrhage into the tissues, probably because of the small size of the growth, and because it has not advanced sufficiently to allow of large hemorrhages to take place in its substance; but small extravasations of blood corpuscles are noticed here and there. Microscopically the growth is practically indistinguishable from granulation tissue, as has been pointed out by Mr. Knyvett Gordon; considered from a clinical aspect, however, there can be no doubt as to its malignant nature.

The jaw was excised for malignant disease of the antrum by Mr. W. J. Pilcher of Boston, to whom I am indebted for the specimen. Infiltration of the surrounding parts has taken place, the gum, antral mucous membrane, and alveolar process being alike affected, and the latter partially absorbed. There is also absorption of the apical regions of both the labial roots. The patho-histology of this growth is identical with that of the isolated cases already mentioned, and from the evidence at hand it seems to be clear that the latter are only earlier stages of the former.

To sum up, it may be said that sarcomatous disease of the periodontal membrane is not rare in its earlier forms, but that it is very seldom met within an advanced condition; and that removal of the molar tooth fortunately cuts short its career if taken sufficiently early, but if it is allowed to continue it constitutes another starting-place for malignant disease of the maxillæ.

A Hint.

Dr. J. E. Davis, in an article in the *Items* says:

“A common hypodermic syringe is superior to an expensive abscess syringe in forcing medicine through dead teeth with fistulous opening; simply press a pellet of soft unvulcanized rubber in the tooth cavity; thrust the needle through this in the canal; hold the rubber pellet in place, and you can get all the pressure you want to force medicines through the canals.”

The Red Coloration of Carbolic Acid.

W. von Hanks has investigated this subject and reports (*Chem. Zeit.*) his conclusions substantially as follows: The coloration is due to an oxidation, the rapidity and extent of which is dependent upon the joint action of certain atmospheric ammonia compounds, the metal of the container and the direct sunlight. On shaking reddened carbolic acid with zinc chlorid a greenish color is developed through the action of the red coloring matter on the zinc salt. When powdered zinc chlorid was added to the fused acid and the whole kept in small well-stoppered blue bottles, no color developed. Carbolic acid placed in tin, in tinned iron, or in aluminum vessels is also free from the tendency toward coloration.

Epidemic Stomatitis.

Cases illustrating an epidemic variety of stomatitis were recently brought before the Society of Dermatology and Syphilography of Paris by Dr. Albert, says the *Jour. Brit. Association*. The affection shows itself in marked desquamation of the mucous membrane of the upper and lower lip, with commissural fissures and red patches in the velum palati. From the diseased surfaces blood frequently oozes. The patients shown both belonged to the artillery corps in garrison in Paris, and Dr. Albert stated that it was the second time an epidemic of that character had come under his notice.

The Monobromate of Camphor,

Thoroughly triturated with sugar of milk, is specific in small doses to all disorders of children caused by reflex nervous irritation, especially those of dentition, says the *Medical Summary*.

Hearing Restored after Twenty-Five Years.

Dr. G. L. Bennett, cites the following incident in the *Dental Digest*:

"A lady fifty years old, who had been deaf for twenty-five years, called to have some teeth extracted. I took out ten roots and both of the upper wisdom teeth, which latter were apparently sound, but had a deposit of osseous matter forming a nodule on each root. As soon as the teeth were removed the patient's hearing returned, and she said at the time she felt something give way and a pressure removed that she had

experienced for many years. She is now wearing a full denture and is a very grateful patient.

All of which shows that the best practice is not to retain apparently sound teeth for crown and bridge-work, without knowing what is on their roots."

National Association of Dental Faculties.

THE twelfth annual meeting of the National Association of Dental Faculties was held at Asbury Park, N. J., commencing Saturday, Aug. 2, 1895. The entire membership of the association was represented at this meeting:

The following resolutions laid over under the rules from last year, were adopted as here given:

Resolved, That in view of the recommendation of the Executive Committee that this association now in session shall require that all colleges, members of this association, shall extend the term of the session of 1896-97, and of succeeding sessions, to not less than six months each.

Beginning with the session of 1895-96, no college shall be permitted to retain membership in this association if it is conducted or managed, in whole or in part, by any person or persons who do not practice dentistry in accordance with well recognized and generally accepted forms, generally known as dental ethics, or if they are owned in whole or in part by men or women who are engaged in disreputable dental practice, or if any college have upon its list of trustees, the faculty, demonstrators, or in any other capacity, any one who does not practice dentistry in accordance with the principles above mentioned. This shall refer to dentists only.

Beginning with the session of 1896-7 the examinations conducted by the colleges of this association shall be in the English language only.

The other resolutions which came over from last year for action were laid on the table.

A resolution was adopted requiring each college holding membership in the association to file with the secretary sixty days before the next meeting a detailed statement of its equipment and facilities for teaching; all new applicants to file a similar statement with their applications. The secretary was instructed to have blank forms printed for the purpose and forwarded to the various schools.

The report of the special committee on preliminary examinations was received and the committee discharged.

The following resolutions offered by Dr. Patterson were adopted:

Resolved, That students in attendance at colleges of this association are required to obey the laws regulating the practice of dentistry in the various states, and failing to do this, shall not again be received into any of the colleges of this association.

Resolved, That when a college in this association has increased the cost

of tuition fees, no student shall be received at the former fee except those who have matriculated at such college prior to such action.

The Committee on Text-Books reported in favor of the adoption as text-books by the colleges of the association of two works, namely, "Dental Anatomy," by G. V. Black, M.D., D.D.S., and "Methods of Filling Teeth," by Rodrigues Ottolengui, M.D.S. The report was adopted.

The following lie over until next year :

Amendment to the rules offered by the Executive Committee:

That each college be allowed two delegates, and be limited to one vote for each school.

By Dr. Peabody: That when a student who has matriculated within the time limit in any recognized college shall, from sickness, death or sickness in family, lack of funds, or other reasonable cause be compelled to retire from that college before the expiration of the term, he may be allowed to make up the deficit of time in the same or any other college (provided he enter at a date not later than that on which he retired), be examined by the last college entered, and if the examination be up to the requirements of that college, and otherwise satisfactory, may be given tickets for advanced standing or graduated, as the case may be.

By Dr. George Edwin Hunt: Amend the last portion of Rule 3 to read as follows:

"Except on such conditions as would have been imposed in the original school, and these to be ascertained by conference with the school from whence he came."

By Dr. Gray: Moved that when students from one college apply for advanced standing to any other college of this association it shall be the duty of the Dean or Secretary of the latter college to ascertain by correspondence with the college from which the student comes if there be any objection to his acceptance.

By Dr. Gray: *Resolved*, That all colleges of this association shall charge not less than one hundred dollars tuition each session.

By Dr. A. O. Hunt: *Resolved*, That a student who is suspended or expelled for cause from any college of this association shall not be received by any other college during that current session.

In case the action of the first college is expulsion the student shall not be given credit at any time for the course from which he was expelled.

Any college suspending any student shall at once notify all other members of this association of its action.

The following resolution offered by Dr. Ottofy was adopted:

Resolved, That the endorsement of applications for membership, made during the coming year, shall be based upon definite knowledge obtained by a careful examination of the methods of teaching, the equipment, and the efficiency of the Faculty.

The report of the committee on revision of the constitution, laws and codified rules was considered section by section, and laid over for final action next year; and the committee, consisting of Drs. Louis Ottofy, A. O. Hunt, and J. D. Patterson was continued.

The following colleges were admitted to membership:

University College of Medicine, Dental Department, Richmond, Va.

Atlanta Dental College.

Birmingham Dental College.

Cincinnati College of Dental Surgery.

Cleveland University of Medicine and Surgery, Dental Department,

The following were elected officers for the ensuing year: S. H. Guilford, president; Geo. H. Cushing, vice-president; Louis Ottofy, secretary; Henry W. Morgan, treasurer; J. Taft, Thomas Fillebrown, B. Holly Smith, executive committee; H. A. Smith, A. O. Hunt and T. W. Brophy, ad interim committee.

The newly elected officers were installed and the president announced the standing committees as follows: J. A. Follett, L. L. Dunbar, Geo. Edwin Hunt, C. N. Peirce and T. W. Brophy, committee on schools; J. D. Patterson, A. O. Hunt, J. B. Willmott, T. E. Weeks, and J. P. Gray, committee on textbooks.

Adjourned to meet at the call of the Executive Committee.

National Association of Dental Examiners.

THE thirteenth annual session of the National Association of Dental Examiners was held at Asbury Park, N. J., commencing Monday, Aug. 5, 1895.

A resolution offered by Dr. Barlow, requiring credentials to the association to bear the official seal of the state board making the application was adopted.

A resolution offered by Dr. Donnally last year, and laid over, permitting persons who have been delegates to the association to be associate members without the right to vote or hold office, was taken up and adopted.

Dr. Jack offered the following, which was adopted:

Resolved, That this body would express to the Association of Faculties the importance of an examination of the equipment, methods, and facilities of instruction of all the dental colleges of this country; it being understood that such examination is to be purely in the interest of higher educational standards and toward an approach to ultimate uniformity in the curriculum and methods of the schools, and more particularly to enable safe action to be made with respect to new schools.

Later a communication was received from the secretary of the National Association of Dental Faculties to the effect that the association had ordered secretary to secure information from the various colleges regarding their equipment and general facilities for teaching; that this information would be systematized so as to be available at the next annual meeting of this body.

The following "plan of requirements for the recognition of dental schools," offered by Dr. Jack, was adopted, with a proviso that it shall apply only to colleges making application at the close of this session.

That each dental school which may in future come before this board for

recognition, must have a teaching faculty composed as follows, to wit: at least three professors of dental subjects, namely, for operative dentistry, for dental prosthetics, for dental pathology and therapeutics. For the medical subjects there must be at least five professors, namely, for anatomy, for physiology, for chemistry, for pathology, and for materia medica.

Its students must also be taught the subjects of chemistry and bacteriology in laboratories adapted to the purpose and under suitable instructors.

That such special school must possess, in addition to suitable lecture rooms, a well-appointed dental infirmary and a general prosthetic laboratory; also, each school must be provided with a room or rooms suitable for manual training in operative dentistry, and must furnish in this way systematic instruction to its students.

All of these provisions are to be determined by careful inspection on the part of the Board of Examiners of the state within which is located the school, or other authorized body duly indorsed by this association. And upon the result of this examination may depend the question of reputability.

The following colleges were added to the list of recognized schools; Dental Department of the University of Denver, Denver, Col.; Department of Dentistry of Detroit College of Medicine, Detroit, Mich.; Dental Department of Western Reserve University, Cleveland, O.

Applications from the following were laid over one year; University of Buffalo, Dental Department; Atlanta Dental College; University College of Medicine, Dental Department, Richmond, Va.; Birmingham Dental College; Cincinnati College of Dental Surgery.

The Committee on Colleges in its report, which was presented by its chairman, Dr. Jack, expressed the view that more should be required to establish the right of dental schools to recognition by this body than good organization and the fulfillment of the rules of the Association of Faculties. Evidence should be furnished that the teachers are of high standing; that they require of their matriculates the stipulated preliminary training, and that they are carefully qualifying their students in every necessary direction. To ascertain these facts is a matter of difficulty. It is necessary, too, in addition to an ascertainment of the character of the faculties of any school, to discover the degree of confidence which has been developed in the minds of the local members of the profession.

The number of students in actual attendance in all the schools of the country for the session 1894-95, excluding those attending special courses, was 4979, as against 3997 at the previous session; graduates 1208, as against 911.

The committee also expressed the conviction that it is becoming evident that the dental schools are increasing in number beyond the needs of the public, owing to the tendency of medical schools to inaugurate dental departments. The installation of dental departments in connection with medical schools is necessarily often incomplete, and therefore the committee believes that restrictions should be placed upon the rapid increase of inefficient dental colleges. As the practice of dentistry is largely based upon knowledge of chemistry and bacteriology, and as manual training has become an integral part of the curriculum of some of the better schools, we recommend that the association do not in future recognize any school unless satisfactory evidence

is furnished that the students of such schools applying for recognition are being taught in modern chemical and bacteriological laboratories, and are also furnished with every convenience for manual training in prosthetic and operative dentistry, and that this latter mode of practical instruction is systematically carried on in at least the first year's course.

The committee also called attention to the importance of a higher standard of preliminary education, and to the impropriety of schools advertising as instructors practitioners who occasionally clinic before the students, but are not a part of the staff of the institution.

The report was adopted.

The following resolution, offered by Dr. Magill, was unanimously adopted :

Resolved, That we will not in future consider favorably an application for recognition from any college which has as a member of its faculty one who also holds membership in the State Examining Board.

Dr. Donnally moved that final action shall not be taken on the application of any college until such application has been in the hands of the chairman of the Committee on Colleges for at least ten months. So ordered.

The following were elected officers for the ensuing year : J. T. Abbott, Manchester, Iowa, president ; H. B. Noble, Washington, D. C., vice-president ; Charles A. Meeker, Newark, N. J., secretary and treasurer.

Adjourned.

Obituary.

AUGUSTUS WOODRUFF BROWN.

AUGUSTUS WOODRUFF BROWN D.D.S., died July 5 at his summer residence in Manchester, Vt., aged ninety. He was born in Litchfield, Conn., and was the oldest dentist in America at the time of his death. He practiced in New York city for half a century, and retired with a fortune fifteen years ago.

He was at first associated with Dr. Solyman Brown, his oldest brother, whose name is one of the best known in early dental literature. In their office at 13 Park Place, New York City, the first dental society in the world was organized and the first dental journal planned. These were the American Society of Dental Surgeons, of which Dr. Eleazer Parmly was first president, and the *American Journal of Dental Science*, of which Dr. Solyman Brown was first editor.

Dr. Augustus W. Brown at one time had the most aristocratic and lucrative practice in New York, and was widely known in social as well as professional circles.

One of the earliest honorary degrees of the Baltimore College of Dental Surgery was conferred upon him.

He married Miss Emma Mandeville, who survives him, together with two daughters. He had nine children, but none of his sons survived to manhood.

Dr. E. Parmly Brown, son of his brother Solyman, studied with him, and is the only member of the family now in dentistry.

Dr. Samuel W. Stockton, uncle of Dr. S. S. White, and the original manufacturer of teeth in America, married a cousin of Dr. A. W. Brown's wife, a Miss Seeley, whom he met at Dr. Brown's house.

The funeral services were held at Manchester, and the interment was in the family vault in old Marble Cemetery, New York city.

SIR JOHN TOMES.

SIR JOHN TOMES, who died on July 29th, 1895, was one of the most noted dentists of Great Britain. He was born in 1815, and began the practice of dentistry in London in 1840. In 1845 he delivered the course of lectures at Middlesex which marked a new era in dentistry, and when published in the *Medical Gazette*, and afterwards, in 1848, in book form, at once made his reputation as a scientific observer.

In 1850 he received the Fellowship of the Royal Society, as being "distinguished for his acquaintance with the sciences of anatomy and physiology." Meanwhile he had been engaged in writing his "System of Dental Surgery," which was published in 1859, and which is well known to the dental profession. He did a great deal toward bringing European dentistry to the standard it now enjoys, and is entitled to a prominent place in the annals of our profession.

New Publications.

WORLD'S HISTORY AND REVIEW OF DENTISTRY. Edited by Henry Lehnalm, D.D.S. Chicago: W. B. Conkey Co., Pub., 1895.

The author of this book deserves the thanks of the profession for the production of such a valuable work. This compendium of facts and historical data regarding the dental profession has been compiled from the most reliable and authentic resources available.

After giving an historical sketch of dentistry in America the author presents a list of dental colleges, of dental journals, national associations and societies of the United States. This is followed by the full text of all the dental laws in North America, Central America, West Indies, South America, Europe, Africa, Asia and Australia. It is the most complete book yet published on this subject and a most useful one for reference. You can secure it by sending \$5.00 to the author, Dr. Henry Lehnalm, Rockford, Ill.; or order it from your dental dealer.

ANNOUNCEMENT.—The Funk and Wagnalls Co., publishers of the new "Standard Dictionary," announce the publication of a new series of educational books, students' standard dictionary, standard synonyms, etc. These will be in some measure a complement to the Standard Dictionary. This dictionary continues to receive the highest praise from philological scholars everywhere. It certainly deserves it as it is one of the most remarkable publications of the age. If you have not yet secured a copy of the Standard Dictionary do so at once.

SOCIETIES.

Southern Dental Association.

THE next annual meeting of the Southern Dental Association will be held in Atlanta, Georgia, commencing the first Tuesday in November. Arrangements are being made for the greatest meeting in the history of the "Southern." The Cotton States and International Exposition will be in progress and railroad rates will be very low. All friends will be given a hearty welcome.

E. P. BEADLES, *Cor. Sec'y.*

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CONTRIBUTIONS.

The Esthetic Correction of Facial Contours in the Practice of Dental Orthopedia.*

BY C. S. CASE, M.D., D.D.S., CHICAGO.

I USE the term "dental orthopedia" in preference to that of orthodontia because it is more applicable to our present advancement in this department of dentistry. The latter word, being derived from the two Greek words *orthos*, straight, and *odons*, tooth, is confined to the straightening or regulating of the teeth; whereas the present definition of orthopedia—from *orthos*, straight, and *pais*, child—is "the surgical and mechanical correction of deformities of children and of deformities in general." The prefix "dental" localizes its scope to the region of the teeth. Its meaning now may be confined to straightening the position of the teeth, and also to the correction of all deformities that are due to a malposition of the teeth or that can be corrected through the medium of the teeth.

The correction of certain deformities of the face, or the esthetic remodeling of the natural features by changing the shape and surface contour of the bone over that region of the face that can

*Read before the Tri-State Dental Society at Detroit, June, 1895.

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be affected by force appliances attached to the teeth, has been the subject of numerous papers presented by me before leading dental societies. And as these have been widely published, I presume that the majority of my present hearers are well informed in regard to my claims, and the principles, at least, involved in the treatment I have proposed.

The principal object of presenting the subject at this meeting is to afford an opportunity to many who have been unable to see cases I have treated, or personally examine the plaster casts, which, I have reason to believe, speak far more eloquently of the truthfulness of what I have been able to accomplish in this class of dento-facial irregularities than it is possible for me to express in words.

Of these casts, which I here present, the larger portion have been selected from cases that were used to illustrate the papers read at the World's Columbian Dental Congress and the last March meeting of the Odontological Society of New York City, and published in the proceedings of these meetings. In addition, I now present the casts of three cases that have not been shown elsewhere (see cases 3, 4, 5), the whole comprising every variety of that class of facial deformities that are due to a marked irregularity of the teeth accompanied by a facial defect that can be remedied only by a decided movement of the roots of the anterior superior teeth. This does not refer to the far more common deformities that are caused by a malposition of the crowns of the anterior superior teeth, nor does it include those very common forms of facial imperfections where, though the teeth themselves show no special irregularity, they can be used, without harm to their usefulness or position, as means for applying force that will result in a decided beautifying of the face.

I believe the time is not far distant when the skillful operator in dental orthopedia will be able to esthetically correct and beautify many common types of facial imperfection which we ordinarily recognize and denominate as "plain," "unattractive," and even "ugly."

This will be accomplished by force appliances attached to the teeth and worn for a few months during youth, or at a time when the immaturity of the bones permits them to yield most readily to the proper force, the teeth in these instances subserving the purpose of convenient places for attaching the appliances, and,

through this medium, of directing and applying the force to the bones over that portion of the face which requires movement.

This subject is a new one, and, as Dr. Farrar has kindly remarked, "decidedly an advance step in orthodontia." It, moreover, pertains to a practice somewhat beyond the scope of dentistry proper, and yet one that cannot be touched by the general orthopedic surgeon, because it requires for its perfect accomplishment an intimate knowledge of the teeth and the manipulative skill of

CASE 1.



a dentist. I therefore present it to you for what it is worth, with the belief that those who care to give the subject any thought must be convinced of its possibilities after a careful examination of these models, leaving it for those who have been intimately associated with some of the cases I have treated to convince you of its practicability.

A second object of this paper will be to modify some of the sanguine expressions in my early publications on the subject.

In the first half-dozen cases of this character which I treated,

I was fortunate in meeting with no obstacle whatever. In fact, the very first case for which I invented the peculiar apparatus which I have used so successfully for applying force to the roots of the teeth responded so readily in every respect that I was able to make a greater change in the positions of the teeth and shape of the face than I have since been called upon to accomplish. See Case 1, Miss S., age 13.

By examining the plaster casts which were made at the beginning of the operation, it will be found that the upper dental arch was decidedly small and retracted, while the lower was large and prominent, with the peculiar open occlusion characteristic of a mouth-breather.

This gave to the face a long, narrow, and decidedly angular appearance. The lower lip protruded with an entire obliteration of its usual graceful curve, while the upper lip and middle features of the face were equally depressed. The lower part of the nose being drawn back by its muscular attachments to the depressed bone, assumed a thin and pinched appearance. Within seven months from the commencement of treatment, much to my surprise and the pleasure of all, this was corrected, and to-day, as has often been remarked, she is quite a handsome young lady,—the final model of her face hardly doing justice to her present appearance.

This and similar successes led me to the conclusion and published opinion that I could with perfect facility move the anterior portion of the superior maxillary process forward or back to any extent that a case might demand; and also to the statement that when force was applied to the anterior teeth in phalanx in the manner described, they would not move by virtue of the absorption of the walls of the sockets, as ordinarily occurs, but that the entire bony structure in which they were imbedded would be carried bodily forward or back with the roots.

I now desire to say that I believe my original claims will hold good in nearly all cases where the treatment is attempted sufficiently early in life, but that instances will occasionally arise when the contrary seems to be true.

When abnormal prominence of the features occurs along the upper portion of the superior lip and lower portions of the nose, caused by the position of the roots of the anterior superior teeth and maxillary process, reduction can rarely be performed with

ease. Especially is this true if caused by the anterior position of the roots of the cuspids. These roots being surrounded by the most massive and dense part of the superior maxillæ, in which they are deeply imbedded, together with the fact that their position is such that their movement bodily in a posterior direction necessarily requires the absorption of a large portion of bone, makes this operation one of the most difficult in dental orthopedia. The posterior movement of the incisor roots is not as difficult,

CASE 2.



as can be well understood by examining a macerated skull. The bone in this region, because of its peculiar shape, will usually respond to the proper force by bending bodily.

Especially is this true when force is applied in the anterior direction, as is well shown by the casts of a number of the cases which I have brought for your inspection. And while this movement in a posterior direction would theoretically seem to be impossible for an adult on account of the position and early ossifica-

tion of the vomer, I am pleased to call your attention particularly to the practical demonstration of this principle for patients older than eighteen.

Case 2 is that of a young lady who was twenty years of age when I commenced treatment.

It will be seen by an examination of the models that the roots of the anterior teeth, at the beginning of the operation, were very prominent. The crowns of the incisors being inclined inward, gave to the face a bulged and very unhappy expression along the superior portion of the upper lip, affecting the shape of the nose. You will see the same expression in the beginning face model of Case 3. This condition more or less intensified, is not an uncommon one. If you have not often observed it among

FIG. 1.



FIG. 2.



your patients and others, it is because you have not learned to classify it among the conditions which demand your skill.

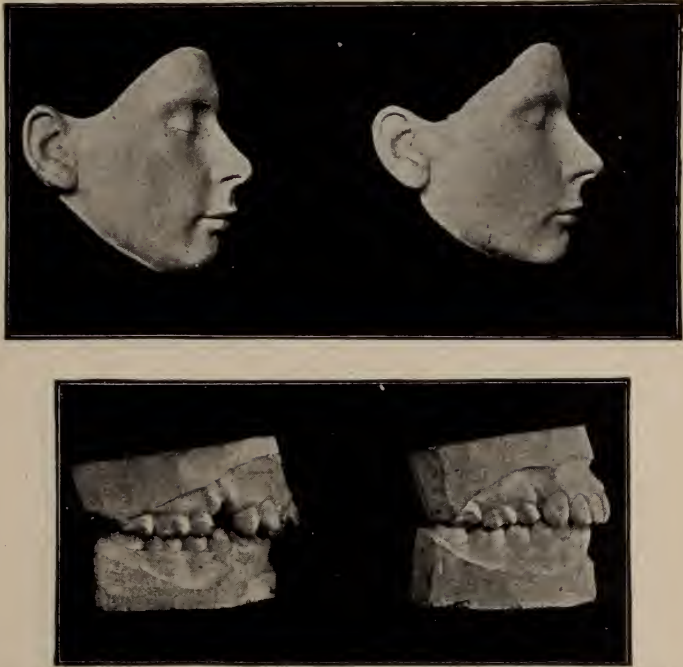
The teeth of these persons are often in proper alignment, and through long habit and avocation you proceed to treat them with little heed to the facial defect which their position produces. If you think of it at all, it is to become conscious that the face is homely, plain, or ugly,—made that way,—unchangeable.

And so the subject is dismissed as one which makes no appeal to you; yet this, as well as many other facial imperfections that are produced by a malposition of the teeth, is a condition which, if taken early, can be remedied with no great difficulty; and in doing so you will confer one of the greatest of human blessings. Now see what I have accomplished for this young lady. Notice in the final model of her face the improvement in the shape of her nose, the ease and graceful curve of her upper lip, and the natural

pose and perfection of her mouth. To-day she possesses a face of more than passing beauty, produced from one that was, to say the least, exceedingly plain and unattractive. Nor is it possible for you, as in other cases, to fully appreciate the change by these models, the difference in all these cases being far more marked in conversation.

But what of the difficulties? Please to remember that a

CASE 3.



person over twenty years of age is not a typical case for moving the roots of the six anterior teeth in a posterior direction.

The wonder is that I was able to accomplish so much. The first bicuspid were extracted. The second bicuspid and molars on each side were banded, and the bands firmly united and cemented to the teeth. From these anchorage attachments the reciprocating force bars extended to the anterior teeth, as will be described later. For nearly one year the great power of this apparatus was continually exerted in forcing the roots of the six anterior teeth and their surrounding bone to take a more poste-

rior position. During this time the spaces produced by the extraction of the bicuspid were entirely closed; and, as a proof of the amount of force that was used, this was accomplished almost wholly by a forward movement of the posterior teeth: not by tipping their crowns forward, but by bodily moving them almost in an upright position through the process. For, as will be observed by a careful study of the models, the anterior teeth at their

CASE 4.

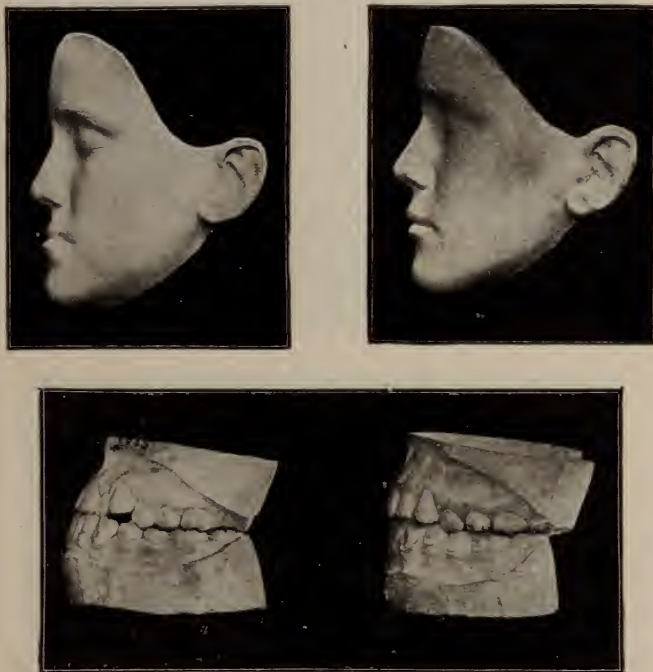


cervices have been forced back but very little. The occluding ends of the teeth, especially of the incisors, have been forced slightly forward. The great force being exerted at their roots seems to have moved the apices back at least one-eighth of an inch. Fig. 1 fairly represents the original relative position of the central incisors during a masticating occlusion, and Fig. 2 the present position.

Case 3 is that of a young man who was eighteen years of age when I commenced treatment a little over one year ago. The teeth are large and strong, jaws and bones proportionately large

and rigid. The facial prominence or bulging of the face in the region of the wings of the nose was far more pronounced than was the former case, and unfortunately due largely to the anterior position of the roots of the cuspids. After the first bicuspid were extracted, anchorage attachments were made for the posterior teeth as before, but the reciprocating force bars extended only to the cuspids. The anchorage was further enforced in this

CASE 5.



case by rubber bands extending from the upper attachment of the cuspids to the posterior ends of a bar that was attached to all of the lower teeth, as has been repeatedly described by me elsewhere.

The power of this apparatus was continued from May, 1894, for eight months, since which time to June 10, 1895, the incisors have been included by an extension of the force bars. I removed the apparatus at this time for the purpose of taking impressions to bring the models of the case before you in its present incomplete state.

The bicuspid spaces have been closed partly by the forward movement of the anchorage teeth, but not so much as in the former case; nor have I been able to retain them in as upright a position. The roots of the cuspids, which seem to present an almost insurmountable resistance to far more force than I have ever employed in any other case, have moved appreciably, but not as much as I hoped. I leave it for you to judge of the im-

CASE 6.



provement, which is quite marked in some particulars, not shown by the face models, and due to the regulation of the incisors.

Now, I wish to introduce to your notice two cases, 4 and 5, which are the only ones where I have attempted a forward movement of the roots of the superior incisors that the surrounding process and immediately adjoining bone did not move bodily forward with the teeth.

Case 4, Miss J., aged sixteen, commenced treatment September 12, 1894.

Case 5, Miss F., aged fourteen, commenced treatment September 22, 1894.

In both these cases, as soon as there was an appreciable movement it was accompanied by a decided prominence over each root, showing that the roots had moved by the immediate absorption of the alveoli and the bending outward of the anterior alveolar plate. In one instance, before my attention was called to it, I could distinctly see the shape and position of the apices of some of the roots, which looked as if they were just ready to burst through the gum. Whenever this condition seemed to endanger the possibilities of success, the force was reduced, but not sufficient to allow the roots to return. Then I would wait for the ridges to be evened up by nature building in new tissue, when force would be again applied for a little further movement.

The necessity of these interruptions in the progress of the movement has required for these operations a much longer time than would otherwise have been necessary, and, though neither are complete, the present results are quite satisfactory as regards the possibility of bringing about the desired position of the teeth.

Considered, however, from the standpoint of esthetic facial development, they can never be as successful as they would have been had I been able to command a movement of a greater area of the superior maxillary bones. Had the teeth in many other cases I have treated moved in the same manner, they would have proven utter failures in the main object that was successfully attained, because they required something more than the mere movement of the roots and alveolar process. And this is true, though fortunately to a somewhat less extent, of these cases.

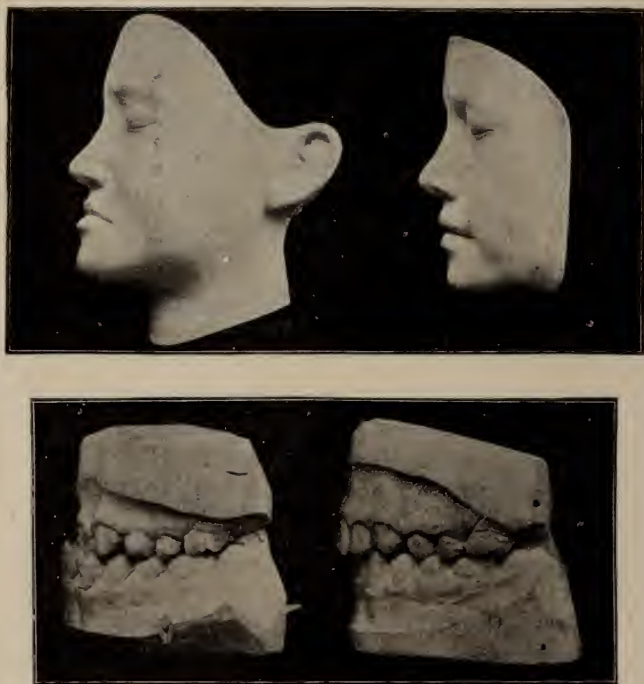
Before proceeding with the reading of the remainder of my paper, which pertains to the construction of apparatus, I will briefly describe the models of other cases I have brought for your examination, and which have been used to illustrate other papers presented at other meetings.

Case 6, Miss M., aged sixteen; commenced treatment December 26, 1893; staying bands October 15, 1894.

In this case the upper jaw was too small for the teeth, which were greatly crowded, and with the cuspids, as will be seen, in their customary positions under these conditions. The dental arch was lacking in its anterior extension rather than width, the incisors being quite posteriorly placed as regards the other teeth, producing a marked depression of the upper lip that was decidedly inharmonious, to say the least. In preparing it for the

application of the contouring apparatus, the crowns of the incisors were first forced forward with jack-screws, and the cuspids crowded down more nearly into alignment. At this stage in the operation, models of the case were exhibited at the Illinois State Dental Society, to show the common facial result of the ordinary method of correcting this character of irregularity. The crowns of the incisors were pushed forward at a considerable angle, and

CASE 7.



all the teeth were crowded, with contracted interproximate spaces. The incisive fossæ seemed deeper than ever, while the facial imperfection was unimproved.

Now, mark the change which occurred after wearing this, the contouring apparatus, four months. Notice the upright position of the incisors, and the ample room that has been obtained for all the teeth; and, moreover, this change has produced, as in other instances, a decidedly favorable improvement in the face.

Case 7 is that of a girl, thirteen years of age when I commenced treatment, and which was finished in six months.

I wish you to particularly examine this case, because, more than all the rest, it exemplifies the entire movement of the incisors and intermaxillary process, without the slightest apparent change in the position of any of the other teeth, with the exception of the cuspids, which were allowed to fall into more perfect alignment.

CASE 8.



Case 8 is that of a Jewess, thirteen years of age, which was also finished in less than six months.

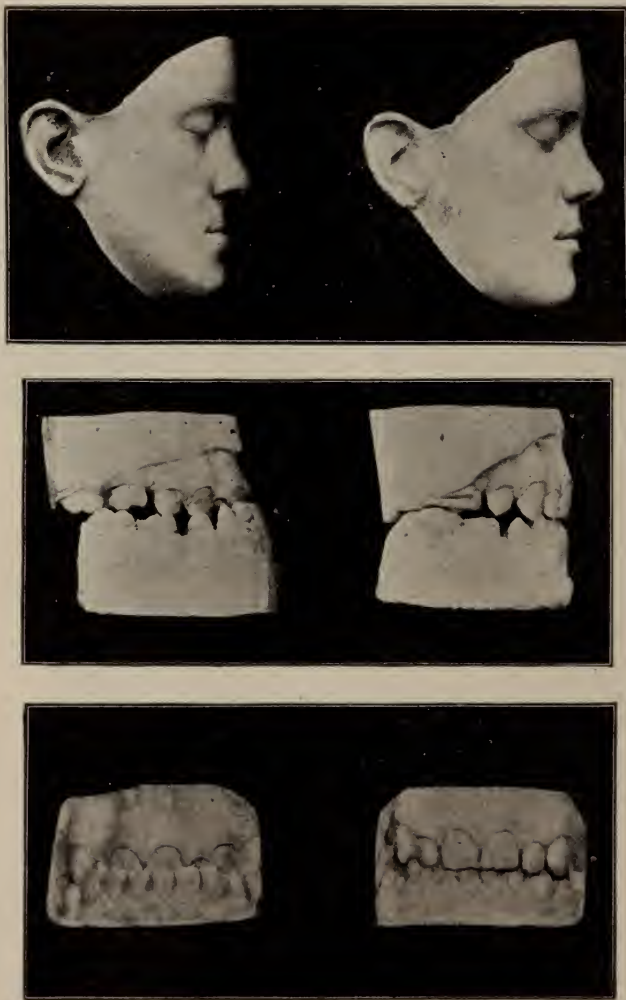
This was an inherited family type, and one that is often mistaken for a prognathous jaw, and occasionally treated with a submental splint and head-gear, in an attempt to force the chin back. The superior maxilla was so small and retracted that the teeth flared outward to meet the lowers.

Treatment in this case consisted in expanding the dental arch forward and laterally, and so applying the force that there was a much greater movement of the roots than the crowns of the teeth. This resulted happily in a general enlargement of the maxillary process, with a much fuller contour to the middle fea-

tures of the face, even to straightening the nose, as in Case 1.

Case 9 is that of a boy, fourteen years of age, which I will leave for Dr. Cushing to describe, as it is one of the cases he referred to me.

CASE 9.



In answer to numerous inquiries, I have decided, in this connection to describe and fully illustrate some of the important features of the latest methods I have adopted in the construction and application of the contouring apparatus.

I do this with the hope that some of the difficulties I encountered in my first cases may be avoided by you, and which were partly due to the comparatively crude construction and application of the apparatus I used then and published in my early writings upon this subject.

"The limited area upon which force can be applied to a tooth, compared to that portion covered by the gum and imbedded in a bony socket, has made it next to impossible, with all ordinary

FIG. 3.

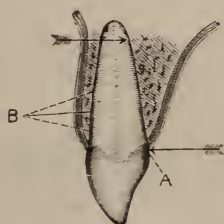
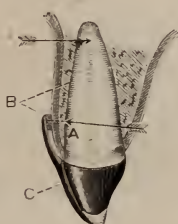


FIG. 4.



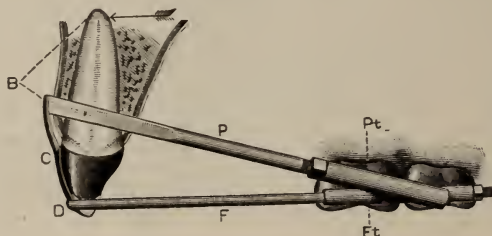
methods, to move the apex of the root in the direction of the applied force; nor could this ever be accomplished with force exerted in the usual way at one point upon the crown, however near the margin of the gum it be applied, for the opposing margin of the alveolar socket must receive the magnitude of this direct force, and in proportion to its resistance it will become a fulcrum, exerting a tendency to move the apex of the root in the opposite direction."

But if in the construction of the apparatus a static fulcrum is created, independent of the alveolus, at a point near the occluding portion of the crown, while the power is applied at a point as far upon the root as the mechanical and other opportunities of the case will permit, the apparatus becomes a lever of the third kind, the power being directed to a movement of the entire root in the direction of the applied force.

This proposition is made plain by reference to the diagrams. In Fig. 3 let *A* be a point upon a central incisor, at which force is applied in the direction indicated by the arrow, then will the opposing wall *B*, of the alveolar socket, near its margin, receive nearly all of the direct force, and in proportion to its resistance will there be a tendency to move the root in the opposite direction. This proposition will also hold good even if we apply the force at *A*, Fig. 4, or as far upon the root as may be permitted,

by attaching a rigid upright bar, *C*, to the anterior surface of the crown; the only difference being that we distribute the direct force over a greater area. But if, as in Fig. 5, we attach to the lower end of *C* a traction-wire or bar, *F*, and further enforce the mechanical principles of our machine by uniting its posterior attachment to the anchorage of the power-bar *P*, we will have neutralized our anchorage force materially and created an independent static fulcrum at *D*. Our apparatus now will distribute

FIG. 5.



its force over the entire root, and give us complete direction and control of whatever power we put into it.

The entire tooth can be carried forward bodily, or either end can be made to move the more rapidly. The force thus directed to the ends of the roots will have an increased tendency to move the more or less yielding cartilaginous bone in which they are embedded.

For material for regulating appliances I prefer German silver, not because of its inexpensiveness, but because much experience with all metals has taught me that none possess the same favorable qualities for this work.

The bands which surround the teeth should be wide and thin. If No. 10 B and S. gauge wire is rolled to four, or four and a-half thousandths of an inch, it will usually be about the right width. This banding material should be drawn firmly around the natural teeth, the ends bent sharply to a right-angle for the joint. When these are soldered, the joint should project about a thirty-second of an inch, with its sharp corners clipped. Then the bands should be carefully fitted and burnished to the teeth with the joints a little to one side of the center of their anterior faces, to allow the upright bar to take its proper position, exactly in the center and parallel with the long axis of the tooth, and also to serve as a strengthening girder to the attachment. These

and other small details may seem unnecessary, and yet, practically, they are of vital importance in the construction and application of the apparatus. It will be remembered that I originally made these upright bars of flattened No. 18 wire, leaving the ends long enough to bend over when in place, and clasp the force bars. The operation of bending the bars was often a difficult and painful one, especially when it became necessary to remove and re-cement a band.

For upright bars I now cut pieces from Nos. 15 or 16 wire, about three-fourths of an inch long. These are filed slightly at the middle to receive the band, to which they are firmly soldered in the position described. Then they are bent and filed so as to fit perfectly the face of the tooth against which they are to rest. They should also follow the curve of the gum, nearly touching it, and extend above its free margin about one-fourth of an inch. The perfecting of these can only be accomplished at the chair. Finally, the bar is shaped with a file, according to whether force is to be applied in an anterior or a posterior direction.

I will first describe the method of procedure for cases which require a forward movement of the roots. In cases of this character I have never found it necessary to apply force to other roots than those of the incisors. The cuspids are usually retarded from taking their positions of alignment by the posterior positions of the incisors, and are frequently so prominent that it first becomes necessary to force the crowns of the incisors forward with jack-screws or otherwise before the contouring apparatus can be effectively placed.

Usually in those conditions when the cuspids interfere, the upper ends of the upright bars can be at first ligated to the power bar, and thus the incisors forced forward until the power bar can be slipped into its proper position, which, as will be described, is always back of the upper end of the upright bars, against which it presses for the purpose of exerting force as high as possible upon the roots to be moved.

The posterior surface of that portion of the upright bars which stands in front of the gum is filed flat, so that their antero-posterior thickness tapers to one-half their original diameter at the ends, where they serve as rests for the power bar.

The anterior surfaces of the ends are rounded and polished to a thin edge. These ends should not extend above the upper

edge of the power bar, unless it seems necessary to bend them at the extreme end to form a catch to prevent the power bar from sliding up.

The lower ends are grooved with a small round file to receive the fulcrum bar, which is a wire (No. 22 or 20), threaded only at one end in the No. 12 or 11 hole of the Martin screw-plate, the other end being held in place by bending it back after passing it through the lower anchorage tube.

The power bar should be made with the greatest care, in order that it be of the required rigidity and strength. Extra hard German silver wire, No. 10, should be drawn without annealing to Nos. 13 to 16—the size being regulated by the probable power necessary, and also by the distance from points of attachment and application. In other words—when the anterior end of the anchorage tube (*Pt*) at which the nut works, is even with the bicuspid or at no great distance from the points of applying the force, less rigidity of the bar will be requisite; and again, for very young patients or where little power will be needed for the required movements. Ordinarily, however, No. 13 will not be found too large.

When it has been drawn to the proper size or selected and cut about the right length, that portion which is to extend between the right and left first bicuspid should be flattened in the rollers to about one-half its diameter. Then it should be bent so as to conform to the shape of the gum along the line where it is to rest. After bending closely over the cuspids, it should extend straight back into the tubes, into which its threaded ends should pass from one-half to three-fourths of an inch.

For more complete direction in the proper method of cutting a screw, making drills, taps, and nuts, I refer you to other writings where I have fully described the process.

The construction of the anchorage attachment which now remains to be described is of the greatest importance to the ease and accuracy of its application and subsequent usefulness.

Two molars, or the first molar and a bicuspid, and sometimes all three, should be selected for the anchorage teeth. When these are accurately fitted with wide bands, an impression in compound, of one side at a time, including the cuspids, should be taken. The bands should then be removed from the teeth without bending, and carefully placed in their proper position in the

impression which should be filled with Teague's or other investing compound. You now have the bands upon a small model that will hold them firmly in their proper relative positions during all the soldering process.

As the position and mechanical perfection of the power tube (*Pt*, Fig. 5) is of paramount importance, it should receive first attention.

Select a strong tube one-half or three-fourths of an inch long, that loosely fits the threaded end of the bar. Its anterior end should be placed so that the nut will work freely upon the bar without impingement upon band, tooth, or gum, and it should take a direction that points exactly to that place upon the cuspid over which the power bar is to extend. In order to strictly observe this important direction, it usually becomes necessary to raise one or the other end of the tube from the bands by the intervention of lifts. It is often convenient to rest its posterior end upon the lever tube, its sharp projecting edges being rounded so as not to irritate the cheek.

The lever tube (*Lt*, Fig. 5) should also loosely fit its bar or wire, and be soldered directly to the bands, which it firmly unites, and thus serves to give statical strength to the anchorage. Their direction is not as material as that of the power tubes, because of the smallness and flexibility of the lever wire. Their posterior ends should project sufficiently free from the other parts to admit of the working of the nut. And in those instances where reciprocating rubber bands are to extend to a lower appliance,—the advantage of which has been explained elsewhere,—I allow these tubes to project for that purpose, finding them much more convenient than the buttons which I formerly used.

The tubes now being fitted with their joints turned toward the bands, they are attached with an abundance of silver solder, the bands also being united along their proximal surfaces.

All the parts which have undergone the soldering process are now boiled in sulfuric acid to remove the borax and oxid, after which the entire apparatus is polished and heavily gold-plated.

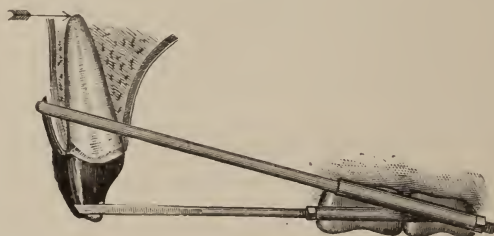
The teeth being properly separated with wax tape, the anchorage appliances should first be fitted to place in the mouth, and the cement allowed to harden before proceeding further, to prevent dislodgment by the force necessary in placing the power-bar in position, especially as it often becomes necessary to remove

and rebend the bar several times in the final perfecting of its shape.

With the anchorage appliances and power-bar in place, the bands for the anterior teeth may now be fitted and cemented, allowing the upper ends of the upright bars to rest in front of the power-bar. Finally, the lever-bar is placed and the contouring apparatus is ready to commence the application of force at the next sitting.

An apparatus for removing the roots of the anterior teeth in a posterior direction is in the main constructed quite similarly.

FIG. 6.



See Fig. 6. The power-bar now being used for traction force, the same rigidity is not as necessary as in the other apparatus. I find, therefore, that a No. 16 wire, not flattened in front, is of sufficient size.

The other, or lever-bar, the force of which acts in the opposite direction to prevent the occluding ends of the teeth from being drawn back, should be as large as No. 18. It should be flattened in the some manner described for the power-bar. The upper ends of the upright bars are grooved on their anterior surfaces to form a rest for the power-bar; while a shoulder is filed on the posterior surface of the lower ends, which forms a slot, when in place, for the flattened lever-bar to rest.

It being understood with this apparatus that the power-bar nuts work at the posterior ends of the tubes, while those of the lever-bar work at the anterior ends. Proper provisions for this arrangement should be made when constructing the anchorage appliances.

The Use of Electricity in the Treatment of Hemorrhage.

BY M. G. JENISON, M.D., D.D.S., MINNEAPOLIS, MINN.

IN the treatment of hemorrhage the dentist often encounters a condition that is of vital importance, for if it is not properly treated the result may be serious if not fatal. It is the exception where there is any manifest expression of the hemorrhagic diathesis, so we cannot be forewarned unless we know the previous history of the patient. Thus when the trouble comes it must be met promptly.

The usual cause of non-coagulation of the blood, or failure of the blood vessels to contract, are too well known to require elaboration.

When a hemorrhage results from the extraction of teeth the usual trouble does not always appear until after the patient has left the office, the bleeding often at the time being very slight. This is probably due to some compression of the surrounding parts in the removal of the tooth.

The bleeding appearing sometime later with various degrees of persistency and profuseness. If the patient does what is proper and calls for attention, which should be given by the dentist, the trouble is usually easy to relieve. But where this is not done, the result is uncertain, except in one respect, and that is that the dentist gets unjustly criticized.

The customary remedies consist of astringent washes, applications of tannin, gallic acid, per-sulfate of iron, etc., and sometimes compresses held firmly in place until the bleeding ceases. But in the treatment of hemorrhage, as in a great many other conditions, you are sure to find exceptions, for there are cases where none of these standard remedies will check the flow of blood. It is in these exceptional cases that I believe electricity can always be relied upon.

Apply the positive pole directly to the wound, having the metal point of such shape that it will come in contact with as much of the injured surface as possible. Then turn on the current gradually until thorough coagulation, but not cauterization, is produced. By this means, I have obtained perfect relief in cases where no effect whatever was produced by the usual remedies, including compressing.

Useful Information.

BY E. H. RAFFENSPERGER, MARION, O.

A Handy Impression Compound.—Very frequently in the summer time we are called to take a small impression, or bite, and as every degree of heat adds to the discomfort of the office or laboratory, the use of the gas stove, or burner can be avoided by using the black or brown "wax," on which the teeth are placed when they come from the shop. The strips should be separated, and the paper taken out from between. This wax, or whatever it is, will remain soft enough from the summer heat to enable us to take partial impressions, etc., and can be used without the aid of artificial heat and is always ready for use.

For Peridontitis.—A very good remedy to abort an ugly abscess, will be found in the following formula, used freely several times a day, on the gum surrounding the offending tooth, particularly during the first stages:

R	Tr. Iodin . . .	3j
	" Aconite . . .	
	" Capsicum . . .	
M	Chloroform . . .	aa gtts. x.

Sig.—Apply to gums with camel's hair brush.

If the abscess is far advanced, and it is desired to hasten the the formation of pus, or as the saying is to "bring it to a head," $\frac{1}{4}$ gr. calcium sulfid, every two hours, given internally, together with the usual local remedies, will help matters wonderfully, and save the patient much extra suffering.

Preparation of Pulp Cavity and Canals.*

BY J. FOSTER FLAGG, PHILADELPHIA.

IN this paper Dr. Flagg said that when such pulp irritation exists as to demand devitalization, there is probably no other application, as yet, more universally resorted to than some combination of arsenious oxid. Regarding the length of duration

* Abstract of a paper read before the New Jersey State Dental Society, August, 1895.

the application should remain in a tooth, he said he left it until the result was accomplished, whether that was five hours or five weeks.

He combatted the claims of thorough removal of pulp tissue as a matter of first importance. He said: "As in a large proportion of canals it is comparatively easy to go to the very end, I regard as a matter of *first* importance that the apical foramen shall not be passed, and above all, not enlarged. That it shall not be passed with a probe, is because secondary or scar-tissue at the apex of every root which has lost its pulp is a necessary sequence, and every irritation of such tissue is disadvantageous and renders it increasedly susceptible to subsequent irritation and inflammation. That it should not be enlarged is because just in proportion as the foramen is normally small—even at its smallest—so is it possible to make a good canal filling whether that filling is of gold or of inspissated or even merely fluid medicament, and inversely, every enlargement of this orifice in equally just proportion renders it less possible to make a perfect filling of long continuance.

As a matter of *second importance*, I should place the non-perforation of the root. As a matter of *third* importance, he said that a portion of the drill should not be broken off and left in a canal. As to why the broken pieces should be removed, he said it was not that they in themselves did any harm, but that, mechanically, they might, in time of possible need, preclude the utilizing of the most important factor in the combatting of peridental irritation, an open canal.

As a matter of *fourth* importance, he gave the removal of every possible portion of pulp tissue.

He spoke very highly of the use of sulfuric acid for opening root canals, as advocated by Dr. J. R. Callahan, saying:

"After a year's experience of this method I can say that I regard it as *the* step in advance, in connection with canal work that has been given us during the past twenty-five years."

The Dental Filling.*

BY JOSEPH HEAD, M.D., D.D.S., PHILADELPHIA.

TIN and cohesive gold are the only materials that may exclude bacteria, but that they do it is not yet proved. Soft foil fillings have been picked out from cavities in a pulpy, evil smelling state, to all appearances full of bacteria, and yet the dentine beneath has been found firm and sound.

It is a most astonishing fact that soft foil fillings may be soft and mushy, without the least harm to the protected cavity, while if cohesive foil fillings are soft or defective on the edge, decay almost invariably sets in. How is it that a filling can leak bacteria and still preserve the teeth?

The explanation is, I think, that the space permits but a comparatively few bacteria to enter. The tooth can resist the onslaught of a few bacteria and it would seem, destroy them, as is shown in the case of mummified black decay. Moreover, many bacteria need the presence of air, and all need a constant supply of food. The fillings tend to exclude both of these essentials for bacteriological propagation. In spite of this fact, no pains should be spared to adapt each plug as accurately as possible. The more perfectly a filling excludes bacteria from a sterilized cavity, the more certain of permanent success.

The experiments with cement and gutta-percha, here given, were presented in a paper read before the Odontological Society of Pennsylvania. They were as follows:

Cones of oxychlorid of zinc and oxyphosphate of zinc were made, having a hollow place within that was absolutely excluded from the outer air. Harvard and Peirce's oxyphosphate of zinc was used that became hard as ivory. Some of the oxychlorid of zinc cones were made from calcined powder, some from the uncalcined. Those made from the calcined powder became extremely dense.

These cones were sterilized in a steam bath by the intermittent process in the following way: First, they were boiled in water two to three hours; then removed from the bath and placed in glass jars, the mouths of which were closed with ab-

* Abstract of a paper read at the New Jersey State Dental Society, August, 1895.

sorbent cotton, and subjected to steam over the water-bath for one hour.

They were then allowed to cool for seven hours in an atmosphere of about 70° F.; again subjected to steam for one hour, and cooled over night. Next morning again heated for about an hour; allowed to cool eight hours. Four hours steam heat, twenty-four hours to cool; one hour steam heat, allowed to cool, and then placed in a bath that after being first sterilized had been tainted with a decayed tooth. At the end of five days' immersion they were taken out and opened. The bouillon had filtered through the substance to the hollows inside. The bouillon found within was swarming with micro-organisms.

The steam bath did not have the slightest effect on the oxychlorid of zinc, but the oxyphosphate, from being very dense, seemed much softened. This might seem to depreciate from the value of that particular experiment; but it would still seem probable, if the micrococci could pass through strong oxychlorid that they could pass through the oxyphosphate, that is so similar to it in substance.

On drying the opened oxyphosphate cones, small, shiny, crystals lined the inside, which looked not unlike free phosphoric acid that had not become chemically united with the powder. And yet the cones before boiling were extremely dense.

The experiments with gutta-percha were as follows: Three canine teeth were taken and opened from end to end. The surfaces of the canals were thoroughly drilled away. One end of each was filled firmly with gutta-percha. A small pellet of cotton soaked with sterilized broth was then placed in the canal. The remaining openings were then dried and filled with gutta-percha. These were sterilized as follows; Two and a half hours in steam bath, four hours to cool, one hour in boiling water, two hours in steam bath, seven hours to cool, two hours in bath, two hours to cool, and placed in tainted broth for five days.

At the end of that time they were taken out, dried, and passed rapidly once or twice through a Bunsen flame. The gutta-percha was then removed with a heated instrument, the cotton was taken out by tweezers previously sterilized in the flame, placed on a clean glass slide, and wet with two drops of distilled water. This water was then found to contain large numbers of bacteria.

If these facts are so, and the evidence would seem to indicate that they are so, what becomes of the fundamental principle involved in the statement that the edges of a filling must be bacteria proof.

Practical Notes.*

BY L. C. BRYAN, BASEL, SWITZERLAND.

New Mat Gold.—This gold has been brought out by Dr. De Trey and has been given the name of Solila. It is a mat gold of superior qualities. It welds with remarkable facility, and it is said a filling can be made in one-third the time required by any other gold.

Sponge Holder with Mirror.—This invention consists of a round mirror soldered to the outside of one point of a pair of pliers. With the pliers a piece of wet sponge is held on the filling or tooth to be ground, and when desired to look at the work with the mirror it can be done by simply turning the pliers over and thus exposing the face of the mirror. It is used to moisten the corundum or any other grinding wheel, and at the same time protects the tongue and lips. It catches the gold that falls when polishing and keeps the corundum cold, sharp and clean. The White moistening pads or any other moisture holder may be used with it. Sponges are preferable, as they do not catch in the grinding wheels. Sponges or pads should be kept ready moist in a dish of water and after use should be preserved in a dish to burn and recover the gold scraps.

After grinding down and burnishing the filling, dip the wet sponge or pad into the polishing powder desired and convey it to the filling and buff or wood wheel or point to be used.

Mirror with Shell-Shaped Rim.—This is very useful when filling the upper teeth, as it conveys the filling material to the cavity and catches all the fragments which may drop during the operation.

It throws light upon the tooth and reflects the operation and the cavity at the same time. Moreover, it is useful in catching chips and old fillings or any other small object removed from the teeth or cavities.

* Abstract of paper read at American Dental Association, Aug., 1895.

The Cervical Clamp may be described as a bow clamp soldered to a spring cravat holder. It is very easy to hold, as the fingers and thumb get a good grip of the roughened handle or ends. By pressing the back, the clamp can be made to slide up or down, so as to fasten it at the back. The front bow having been cut it can be bent in all directions, so that it can be fitted to the most irregular cavity.

Report of Special Committee on Dental Nomenclature.*

BY S. H. GUILFORD, D.D.S., PHILADELPHIA, PA.

. . . The nomenclature of any science or art, like a language, is not a creation but a growth. It starts with a small beginning, and is developed gradually. . . .

Frequently the growth of a science or art is so rapid that the terms selected to convey the necessary ideas are chosen without a proper regard to their fitness. Such has been the case with many sciences, and such has, unfortunately, been the case with our own. . . .

We must move slowly and carefully, and advance only as rapidly as we succeed in convincing our fellows of the advisability of the change. Terms that are scientifically incorrect should be discarded at once and correct ones substituted; those that are not absolutely incorrect may be tolerated for a while longer but for the new ones which must necessarily be introduced from time to time, this association should establish a standard or code and use its great influence in securing its approval and adoption by the profession in this country at least. .

While the establishment of a system of nomenclature of international character would be most desirable, the present does not appear to be the time in which to attempt it; but if we can devise and adopt a system for our own country that has a scientific basis and is well adapted to our wants, we believe that it will eventually be adopted in whole or in part by other nations. The framing of a code is a task of considerable difficulty, for no one language contains all of the elements from which to construct a

* Abstract of report read at American Dental Association, Aug., 1895.

perfectly correct and convenient nomenclature. A living language will not do, because it is constantly changing. The choice, therefore, would seem to lie between one of the two dead languages, Latin or Greek. . . .

In the science of electricity, and indeed physics in general; in geology and mineralogy; in theology; in medicine and surgery—especially in the departments of bacteriology and pathology—almost the entire list of recent terms is constructed from Greek roots. If, therefore, these sister sciences, have deemed it best and most satisfactory to base their newer terminology upon a Greek foundation, can we do better than follow their example and keep in scientific accord?

In case we decide to accept the Greek language as a basis for our terminology, however, it does not follow that we must adhere to it rigidly in all cases, for in many instances, no doubt, the Latin, English, or other languages will furnish us with terms that are equally as good and probably simpler in form than corresponding ones derived from the Greek. . . .

Very many of our present terms have a Latin derivation, having been borrowed from our sister profession, medicine; and where these have proven satisfactory and are not etymologically incorrect, we may allow them to remain. Many also have their foundation in Greek, as "gypsum," "asbestos," "prosthesis," "technics," etc.; while a few, like "celluloid," "centimeter," etc., are half Latin and half Greek. In the descriptive anatomy of the teeth, your committee is well pleased with the plan and terms proposed by Dr. Black two years ago, but some modification of that plan will probably be necessary.

Inasmuch as the terms used by common consent to indicate four of the surfaces of the crown of the tooth end in the Latin adjective terminal "al," your committee favors the adoption of a word having the same ending for the fifth or antagonizing surface. Whether this shall be "occlusal" for the bicuspid and molars, and "incisal" for the incisors, as suggested by Dr. Black; or "morsal," for all, as proposed by Dr. Kirk, remains to be determined. Your committee believes that the use of the single term "occlusal" for this surface of all of the teeth will serve our purpose best. As between the words "gingival" and "cervical" we recommend the adoption of the latter, because it is exact in its meaning and has the sanction of long use.

In naming the teeth themselves we strongly condemn the use of such unscientific terms as "sixth-year molar," "twelfth-year molar," and "wisdom-tooth," and urge instead designating them first, second, and third molars respectively.

We also believe it to be more harmonious and appropriate to use the word "cuspid" instead of "canine" to indicate the single-cusped teeth, just as the term "bicuspid" is applied to their adjoining neighbors. So, also, in indicating a particular tooth, it is more methodical and correct to proceed from the general to the particular, naming first the jaw, then the side, and lastly the tooth, as: "superior, left, second molar."

The elision of the final vowel in such words as dentin, iodin, etc., as approved by such authorities as the Century and Standard dictionaries, your committee heartily concurs in and recommends. . . .

Your committee would beg to remind the association that this report marks but the beginning of its labors, and that much time and effort will be required to obtain anything like a complete or satisfactory result.

Nomenclature.*

BY GRANT MOLYNEAUX, D.D.S., CINCINNATI, O.

THE report that I have is supplemental to Dr. Guilford's report, and is in the same line, but pertaining to prosthesis.

The department of prosthesis differs in its nomenclature from the other departments of dentistry in the fact that it contains a great many common words to which we have given a distinctive meaning, and to which the definitions, as found in the dictionaries, would not be applicable. For example, the words "cast" and "model" are often used by dentists as synonyms. The former is found in one dictionary only. "Model" is not recognized in any of the dictionaries to which I have had access.

The accepted meaning of "model" is, "a mechanical imitation or copy of an object; something to be patterned after; anything of a particular form or shape to be imitated."

The word "cast" is given a special meaning in only one dic-

* Abstract of report read at American Dental Association, Aug., 1895.

tionary. In all others it is given the general meaning, as "anything formed in a mold; a mass of plastic material which has taken the shape or form of some cavity."

Many dentists use these words interchangeably, while others give them a distinctive meaning, as follows:

A "plaster-cast" is a fac-simile of a mouth, in plaster of Paris, upon which a denture of celluloid or vulcanite base is to molded; a plaster cast for vulcanite; a tin cast for molding celluloid; a marble dust and-plaster cast for Watts metal.

When the plaster cast is to be used for making a mold for dental dies, to be used for swaged work, it is then called a "model," because it is then to be imitated in metal, and then only is it to be called a "model."

This certainly seems to be a very excellent method, for, by using these terms with a distinctive meaning, description is abbreviated by doing away with explanatory sentences. When we refer to a "cast," we know exactly what it is. When we refer to a "model," we mean that it is to be imitated in metal.

"Vulcanite" and "rubber" are often used as synonyms, the former certainly being the proper term. Caoutchouc or rubber is a definite hydro-carbon. When this substance is combined with sulfur and other ingredients and is vulcanized, or hardened, by subjecting it to a definite temperature for a definite time, it forms a different compound, which in no manner resembles rubber, but is an ivory-like substance which we term vulcanite.

"Velum" and "obturator" are used by many interchangeably. It seems to the committee, however, that such terms can be given a distinctive meaning, even if the function of these appliances be one and the same. By applying "obturator" to vulcanite appliances used in the treatment of cleft palate, and "velum" to flexible vulcanite, the terms seem to be sufficiently suggestive to be retained.

In the metallurgical department we have many terms used improperly, such as "white metal," "platinized silver," "platinized gold." It is not infrequent to hear the term "platinized gold" used when referring to gold alloyed with platinum, often called "clasp metal" and "spring metal."

The most modern information on this subject says, "A metal covered by platinum is platinized; preferably by electrolysis."

I will refer to the definitions of the Century and Standard

dictionaries: "Platinize; to coat with platinum in a fine state of division; platinized, by dipping in a solution of platinum chlorid and then heating in a closed chamber until the metal decomposes."

According to the Standard: "Platinize; to coat with platinum, preferably by electrolysis."

In order to get an idea of this matter from a goldsmith, I sent for a piece of platinized gold of definite gauge, and received a piece of metal, one side being gold and the other platinum, equal weights of the two metals, welded so as to be inseparable.

We have the same combination in the supply-houses, known as "platinized gold" or "crown gold," "platinum" and "gold crown-metal."

The best authorities say "platinous" is the proper word, as "platinous silver," silver *containing* a small percentage of platinum; "platinous gold," gold *containing* a small percentage of platinum.

It also seems that "platinous silver" is to be preferred to the term "white metal," as the latter term is vague and inexpressive, for there are many combinations of nickel known as "white metal."

By adhering to the use of "platinous alloy," "platinous silver," "platinous gold," we have a term that means exactly what it says. It is strictly in line with chemical nomenclature, and is susceptible of improvement. We have now one combination of platinum and gold which we know as "clasp metal." We call it "platinous gold." If for any reason the proportion of platinum in an alloy needs to be increased, we can then have a platinic alloy. If we need to have more compounds, the word is susceptible of improvement by the prefixes "hyper" and "hypo," so that we can always designate the compound by a definite term. While it does not seem that these improvements are necessary, the word "platinous" is the proper one, according to all authorities, and should be adopted when referring to clasp metal or spring gold containing a small amount of platinum, instead of the term "platinized gold."

There is at the present time a good deal of discussion as to the words "aluminum" and "aluminium." A rule has obtained for fifty years or more which designates the rarer metals by an extra "i," such as "palladium," "osmium," "rubidium." When

the metal comes into common use, the extra "i" is dropped, as in the case of aluminum. This would seem to be an excellent rule to follow, because it distinguishes the rare metal from the metal in common use.

Dr. Black has suggested substituting the name "occluding frame" for the word "articulator," in order to be in harmony with the nomenclature of the dental anatomy. Your committee suggest the continuation of the term "articulator:" First, because of its long usage; second, because it is a single word; third, because it is a word more suggestive of the operation to be performed, and we cannot see that it will in any manner interfere with the nomenclature of the dental anatomy.

"Autogenous soldering" is a term often applied to the process which we know as "sweating." The best authorities tell us that it is used erroneously in this sense. It is not quite decided what word would be best, "welding," "sweating," or whether to adopt the term "autogenous soldering." It is still under consideration.

The words "prosthesis" and "prothesis" are used as synonyms. The meaning of the prefixes being slightly different in the original language, "pro" meaning "to put before or to stand before;" "pros" meaning "to place, or to put to place or position," the committee has adopted the word "prosthesis" as being the proper term to use.

A Basis for Dental Nomenclature.*

BY A. H. THOMPSON, D.D.S., TOPEKA, KAN.

. . . It is generally conceded that our nomenclature is greatly in need of correction and codification, and to that end the first thing to be considered is a starting-point. To all students of the subject it would seem that this is furnished all ready to our hand by Dr. G. V. Black, in his admirable study and *résumé* of the subject given before the World's Columbian Dental Congress and published in the Transactions (vol. ii. p. 825). This great paper is a landmark in the history of dental nomenclature, and may well serve as the starting-point for a new departure.

* Abstract of paper read at the American Dental Association, Aug., 1895.

Without wasting time in the discussion of the desirability of having an established nomenclature, on which we are all agreed, we might as well proceed at once to formulate a code arbitrarily. This can best be done by the American Dental Association, which is the national representative body of the profession in this country, the exponent of the opinion and policy of the profession, and as having authority in deciding questions of general interest to the profession. A decision emanating from this body would be held in respect by the profession, and the code of terms of nomenclature would be final and would gradually come into acceptance and use.

A list of the terms in general use should be submitted this year, to be known as "The Code of 1895," and lie over for one year to allow time for discussion and criticism by the profession at large, and then be adopted, with whatever corrections and amendments may seem desirable, at the ensuing annual meeting. Lists of terms in all departments can be added to this code from year to year, as may seem desirable, by being proposed and submitted, laid over for one year for criticism and discussion, and then adopted. Newer terms in regard to some disputed points will provoke discussion, but they must be decided, and decided finally. A year's discussion will probably result in satisfactory terms for the points in dispute.

The writer is disposed to think that terms can be borrowed from the naturalists in naming the parts of teeth, that will dispense with many cumbrous combinations now in use in our literature. Some are offered in the list, and others will be included in the list of names for comparative dental anatomy.

A systematic dental nomenclature should be founded on the zoological system of names of the teeth of mammals employed by naturalists as a basis; on this should be placed a professional nomenclature, like Dr. Black's, for the use of dentists; and on this a still more minute mapping system for the localizing of cavities, something like that prepared by Dr. Kulp. The three systems are indispensable. First, the gross descriptions of teeth; second the detailed descriptions; and third, the minute localization of areas on the surfaces of the teeth. Some arbitrary system of localizing cavities, like Dr. Kulp's, is desirable to avoid the cumbrous combinations of compound words which would otherwise be necessary. Dr. Kulp's plan of mapping the crown

is the best of the kind, perhaps, yet offered. This is a matter that must be considered wisely before the final adoption of any system of minute description, such as is required in locating cavities.

DISCUSSION.

Dr. G. V. Black suggested that we formulate words and rules so far as we can, and then enforce the teaching of so much as has been determined, in the schools. Then by keeping up the work of study and adoption as fast as definite conclusions shall have been reached, we shall have in a few years a nomenclature of which we may be proud. . . .

This association cannot alone establish a nomenclature, but it is the starting point through which it should be controlled.

The best way for us, as has been done in other sciences, is to find some one with sufficient capacity, qualifications, and the taste for the work, with a knowledge of the various languages, to take it up and be the leader. It requires not only one who has the necessary educational qualifications, but one also who has the inclination to work continuously.

Dr. T. C. Stellwagen suggested for students use a small book in which is written the terms used, with their meanings. They are thus taught to use the words exactly as they are intended to be used, and so keep their edges keen. Only two hundred to three hundred words suffice for the ordinary uses of life among the uneducated.

Dr. T. E. Weeks said that the question just replied to emphasized the fact that in our pronunciation of terms, as well as in their proper use, there is still room for improvement. If the movement that has been set on foot is carefully and persistently followed out, great good will result. He hoped the committee would be continued, and that the association may adopt the work of an honest and earnest committee.

Dr. W. C. Barrett wished to call attention to certain solecisms and barbarisms which are very offensive, as "wisdom-tooth" for the third permanent molar, and "fangs" for roots of teeth. There is where, in his opinion, the work of reforming the nomenclature of dentistry should begin; these exceedingly gross violations of propriety and accuracy should first engage our attention.

Dr. A. H. Thompson: This matter of expunging objection-

able and meaningless terms is a work of which the committee recognizes the importance, and they will do it as fast as they can; but they cannot do it all at once. Instances might be multiplied, almost without limit, of variations in the use of pronunciation of words. Thus of "alloy," two pronunciations are in use; of "cement," the same. We must have a distinct basis of understanding of all these matters, and the committee hope in time to have all the errors corrected.

Dr. John S. Marshall moved that the report be accepted and the committee continued, and that the list of words upon which they agree be submitted to the association for criticism and suggestion before final action is taken upon them. So ordered.

Dr. Guilford: Steele compared words to tools. It was an excellent comparison. Words are tools. Driving nails with a hammer, with a monkey-wrench, and with a rude piece of iron, this is analogous to what the dental profession has been doing in its use of words. This report was made to show what the committee had done. Every dental society ought to take up the work, and every man ought to constitute himself a committee of one to look the matter up for himself, and then next year we shall be prepared to act. Then, if the teachers in the colleges and the editors of the journals will use the terms agreed upon, a desirable change will soon be brought about.

Dr. Guilford then moved that Dr. Black be placed upon the committee in place of Dr. Stubblefield, who had been unable to act with it.

American Dental Association.

WE here present the gist of the remarks of discussers on the papers of Drs. Stainton, Jack, and Barrett, abstracts of which were published in the October issue.

Dr. Thos. Fillebrown said there was a general impression that the Faculties Association could prevent the establishment of new dental schools, but this is an error, for they have no power to prohibit them. He thought the number of physicians given in the report was underestimated. That, instead of there being already too many dentists, more were needed, as the graduates, from year to year, did not supply the normal increase. The holder

of a diploma looks upon it as a great hardship to be required to pass an examination before an examining board, before being permitted to practice in some of the other States ; but that is all right. In Massachusetts they have a law of this kind for lawyers and he thought physicians as well as dentists. It seems to be a good whip to hold over the schools, and he would like to see this requirement in every state.

Dr. Jas. McManus spoke of a bill being passed in the legislature of Connecticut, to incorporate a dental college in Connecticut. The Board of Examiners knew nothing of the movement and there were not twenty dentists in the whole State that wanted such a college, for there was no demand for it. The State Society took the matter in hand and succeeded in getting the senate to defeat the measure. They did not want a dental school incorporated that in the nature of things could not be a success.

Dr. C. S. Stockton asked if it was not possible for the colleges to turn out graduates that were gentlemen and reputable dentists ? So many all over the country are advertising and it is a great detriment to the profession. He thought that the colleges could remedy this evil to a certain extent by giving the graduate to understand that if he practiced unprofessionally his diploma would be recalled.

Dr. M. L. Rhein spoke about the enormous amount of poor timber there is among men who call themselves dentists. How are we going to elevate the character of the profession by putting a Chinese wall about us and endeavoring to keep out practitioners, as has been done by a great many States in this country by the laws that have been enacted and some of which will not bear judicial inquiry. He denied the idea of there being already too many dentists to meet the demand. Even if there were no increase in our population, he believed that the enlightenment of the people alone would keep up a demand for all the dentists that the colleges turn out. It would be a great blot on this association to let it go out to the masses that they had taken the position advocated in some of the papers. The vital question is can we make better dentists out of the mass of men already in our profession. The administration of an oath will not help matters. What we need is the establishment of better institutions than we have to-day.

Dr. J. Foster Flagg said that dentistry with him was first,

greatest, best all the time. He referred to Dr. Jack's speaking of a great danger threatening our profession. Are we a profession? Are we united in regarding ourselves as a profession? A few minutes after that he, Jack, spoke of the great facilities which universities have to educate men for our specialty, Dr. Flagg said we are all striving to better our profession, and believed that the university was the very thing to educate men for the profession, but not through the medical physiologist, anatomist, chemist, etc. Regarding State boards, he said they were the foundation for the progress of dentistry, and for a man to be examined from State to State appeared to be the proper thing.

Dr. C. P. Lennox thought the difficulty was more with the people than with the schools. We have for years talked about educating the people, but it is a difficult thing to do. He believed that dentists should be thoroughly educated themselves, but this alone will not remedy the evil of cheap dentistry. The only way to overcome it is to educate the masses.

Dr. E. A. Bogue said that he agreed mainly with what Dr. Flagg had said. It is in vain for us to apply to the colleges to recall their diplomas after they have been given out, unless there is a great moral force brought to bear on the subject. He thought that between the National Association of Examiners and Faculties, together with the moral weight of the American Association, this question could be settled. If there is formulated one standard of education then the States can properly accept diplomas, one from the other.

Dr. J. N. Crouse thought that colleges should not charge a fee for clinical work. This would to a certain extent have its influence, for many of the colleges being started are run for the money that can be made out of them.

Dr. Louis Jack said that the purpose of the second paper was to make apparent the necessity for care in the admission of new schools. This is necessary to bring about a higher standard of dental education than now exists. He spoke about the plan of requirements for the recognition of dental schools as adopted by the National Board of Examiners. (See proceedings in the October issue of this JOURNAL.)

These requirements will not only bring up the standard of the new schools, but will influence the old ones as well.

Dr. L. D. Shepard said that Dr. Crouse had presented the

only solution to the problem. The general impression was that the colleges charged only the actual cost of material for the work done in the infirmary. This was absolutely a falsehood. If the infirmary is a source of great revenue, and he had been informed by good authority that in some instances it netted thousands of dollars, then the solution offered by Dr. Crouse was an admirable one. He spoke of the idea that the dental profession was a liberal one and yet there was not one dental hospital where the poor could get dental service for nothing. How many are giving a half day a week to the service of the poor? With the medical men it was different. They had their free hospitals, and gave their services free. What to do for the teeth of the poor was a vital question, and he hoped to see the day when these hospitals would be established.

Dr. James Truman said : There is not a year that somebody does not assail the colleges. When a man stands up before this great representative body of dentists and says that there is not a dental college in the land that is not a fraud, it is time to stop and consider what we are doing. The charge that the dental colleges are making large sums of money annually out of their infirmary practice, which is supposed to be largely gratuitous, is not true—at least it is not true of the school with which the speaker is connected, and, he believed, not true of the majority of them. They are doing a great service for the poor in caring for their teeth at the lowest possible cost. It is a disgrace to this body that its members will sit and listen to such charges, made in a general way, against the institutions which have been building up dentistry for forty years. There is one thing which must be borne in mind in connection with this matter of caring for the teeth of the poor, and that is that you cannot get at the very poor. The exigencies of their lives are such that they have not the time to come to the infirmary—cannot spare it from the necessities of earning their living. Those who do come must frequently wait for three or four hours to be served. Again, there can never be any comparison of the dentist with the medical man in the matter of gratuitous service to the poor, because of the total dissimilarity of the services which each has to perform.

Dr. H. A. Smith said that the institution with which he was connected did have a hospital in which it was doing gratuitous work. They treated the teeth of children in charitable institu-

tions, and gave them not only free service but made no charge for material used. He mentioned this merely to show that there were some of the colleges doing charitable work and that the charge made that they were not, was untrue.

Dr. W. W. Walker thought there was room for more colleges if the standard was raised high enough.

ALL SORTS.

Cleansing Fluid.

The following is given in the *Dental Office and Laboratory*, as a most excellent preparation:

" R	Chloroform	-	-	-	-	-	2 drachms.
	Alcohol	-	-	-	-	-	$\frac{1}{2}$ ounce.
	Liquid Ammonia	-	-	-	-	-	$2\frac{1}{2}$ ounces.
	Sal. Soda	-	-	-	-	-	$\frac{1}{2}$ ounce.
	Castile Soap	-	-	-	-	-	2 ounces.

Cut the soap up fine and dissolve in one gallon of soft (or rain) water.

Dissolve the $\frac{1}{2}$ ounce of sal. soda in as much soft water as is necessary to take it up, then add this in another bottle to the chloroform, alcohol and ammonia. When the castile soap is entirely dissolved add all these ingredients to it. Shake it up well and bottle it securely. It will keep for years. To remove spots from clothing or carpet use the liquid on a sponge."

A Simple and Easy Method of Abstracting and Cleansing the Teeth from Vulcanite Rubber.

First put the teeth in dry plaster on an iron spoon, covering the teeth with it. Place the spoon with its contents in the fire and let it remain till the plaster becomes red-hot, then withdraw the spoon from the fire, leaving it to cool, which occurs almost immediately. Then remove them from the plaster, and the teeth will be found to be perfectly clear and uninjured, as when received from the manufactory. I have also used this method with vulcanite mounted cases of two and three teeth. No trace, whatever, of any rubber adhering to the teeth. The teeth also become firmer by being annealed.—*Dr. Bernhard in Items.*

**Is not Operative Dentistry Liable to the same Injury from the
too Prevalent Use of Plastic Stoppings, as Occurred
to Prosthetic Practice from the Intro-
duction of Vulcanite?**

This important question was discussed at length at a recent meeting of the Chicago Dental Society. From a report in the *Dental Review* we extract, from the discussion, a gist of the remarks made:—

Dr. C. N. Johnson.—"No plastic filling ever yet invented can rank with gold in its ability to save teeth, when properly manipulated, and no plastic filling calls for the same degree of skill in its use as does gold. With these two facts in view, it is not difficult to conclude that the "prevalent use of plastic stoppings" results in too much temporary work, and a tendency toward diminished skill on the part of the operator. No man may manipulate the plastics exclusively year after year and expect to retain as high a degree of skill as he would if confined to the use of gold for the same time. . . . The operator who habitually uses gold becomes unconsciously more painstaking and expert in all departments of his work. He develops a tendency toward closer attention to details, and close attention to details, plays no small part in ultimate perfection of result."

Dr. J. N. Crouse.—"On account of these two systems of methods in practice, the use of plastics, and, in addition to that, the radical crowning of badly decayed teeth, the dental profession is in very great danger of being decried or lessened in its usefulness, because, as the essayist said, so far gold has nothing to equal it in any way, except as substitutes here and there. The more I see of plastic fillings and the more I study the subject, the more I am convinced that the members of the dental profession should use gold for saving teeth more frequently than they do. We ought to encourage something that requires more effort on the part of the dentist in everything he does, and I do not hesitate to say, that when the day comes that we can practice dentistry without an effort it will be a sorry time for the community."

Dr. E. D. Swain.—"While I sometimes used plastics, as I believe most of us do, I think gold is the royal material for filling teeth, and I think the more we do plastic work the more slovenly we are apt to become in our operations."

Dr. E. M. S. Fernandez.—"If these fillings are used by the skillful dentist, judiciously and honestly, I have no doubt it is a great improvement to our profession. Gold filling has its place; so has plastic filling. So far as I am personally concerned, I could never practice dentistry honestly without the use of plastic fillings."

Dr. Louis Ottofy.—"I believe we should recommend gold as a filling material in the majority of cases where some advocate the use of cements or amalgam. It is essential for us to educate the people up to the point to appreciate good gold work, and when we do that it will redound to our skill, and to the best interests of the people and of the profession.

Dr. J. W. Wassall.—"While it is a good thing for us to advocate the use of gold as a filling material in the majority of cases, still we must not lose sight of the fact that plastics have been of great benefit to the poorer classes."

Dr. T. W. Brophy.—"In order to answer this question, we must find the people that are operated upon, where plastics are used almost exclusively, and then we may answer the question, is dentistry liable to fall into the same unfortunate position in the operative department that it fell into in the mechanical department when vulcanite was introduced. That is the only way to get at this matter, observing as we do the operations that have been performed by the introduction of oxyphosphate of zinc, oxychlorid of zinc, and the various amalgams.

Dr. Garrett Newkirk.—"We must exercise judgment in these matters. The man who uses a material adapted to the particular case, who studies the interest of the patient first of all, next the interest of his profession, his own skill and reputation, is the man who is the successful dentist, and whether he puts in gold, amalgam or cements, he is the man who does it from beginning to end faithfully, honestly, and to the very best of his ability."

Dr. G. J. Dennis.—"The prevalent use of plastics creates a demand for their use. When a patient comes to you and asks you to put in a gold filling, and you find from the nature of the case that a plastic filling would be better suited to the case, you simply follow your own judgment and it is not necessarily encouraging cheap dentistry; but the next time the patient comes to you to have a tooth filled and you recommend gold, he is very apt to want an amalgam or some other plastic filling inserted. In this way the standard of dentistry is lowered. Another thing that lowers the value of operative dentistry in the patient's eyes is the decreased cost of these fillings. He will size up the cost of a gold filling and the cost of an amalgam filling, and it is easy to see how he will demand plastic fillings. It directly affects the operator when he finds that the value of his services is decreased. In proportion as he finds the value of his services diminished he finds himself diminishing in his skill. It is here the danger comes in, it seems to me, in the too prevalent use of plastics.

Dr. A. W. Harlan.—"The too prevalent use of plastics in communities thickly settled has had a tendency to lower the profession in the eyes of the public."

Swallowing of a Partial Denture with Successful Passage after Administration of a Cathartic.

Dr. J. Maxwell Wood, cites the following case in the *British Dental Journal*:

"M. W., æt. 18, a domestic servant in the employment of one of my patients awakened one morning with her artificial plate, which she wore during the night as well as during the day, missing. She made diligent search for it, but with no success. Later, uneasiness in the epigastrium with slight colicky pain, forced the unpleasant conviction home to her, that she had swallowed it whilst asleep. Scarcely realizing the significance of the situation she confided her story to her mistress, who immediately sent off for the family medical attendant, and meanwhile, whilst waiting his advent, she administered, of all things, a sharp dose of castor oil.

The plate was made by myself, and I was able to show Dr. F. its exact size and the nature of its attachments. The attachments were two short blunt gold bands, and the plate itself measured $1\frac{3}{4}$ ins. by its longest diameter, and $1\frac{1}{4}$ ins. by its shortest, forming as one can readily understand, a foreign body, whose presence might effect the most disastrous results.

Dr. F. in possession of these particulars proceeded to the house, when to his relief, and no less astonishment, he found that the plate had been passed with very little inconvenience to the patient, and that, within one hour of the administration of the castor oil. She is once more happy in the possession of her plate, but no longer wears it at night.

May we not take the narrow escape of this young girl as a lesson to ourselves, to persistently urge the removal at night of dentures which are at all loose."

Root Canal Filling Material.

I use a preparation that is anti-septic, tough, and possessing some elasticity, which under pressure is capable of being made to penetrate the minutest root canals. This is composed of three parts of resin, one part pharmacopeal resin ointment mixed with two parts of lycopodium and a sufficient amount of hydrargperchlorid to make it 1 in 1000. A little of this is taken at the end of a small spoon excavator, or small plugger, and pressed into the root canal where it is left. The advantage this possesses over those I have named is that it is in the first place antiseptic, it is more easily introduced, it is equally easily removed, and it has not given rise to any unfavorable symptoms in the teeth where it has been for a considerable time.—T. C. Reece, *British Journal*.

Pathological Condition of the Mouth due to Artificial Dentures.

In a paper read before the Ontario Dental Society and published in the *Dominion Dental Journal*, Dr. C. S. Butler says :

“The presence of an artificial denture upon the mucous surfaces of the mouth, pathologically considered, is cause for apprehension, and in view of the large number of persons who by reason of the premature loss of their dental organs are required to wear them, it is of the highest importance that this deleterious influence should be recognized and eliminated as far as possible. When inserting an artificial denture, it should always be borne in mind that a foreign body is being introduced in the oral cavity, which may become to a greater or less degree an irritant to the tissues and organs with which it comes in contact. That it is possible for any mouth long to endure these substitutes without pathological disturbances, becomes more and more inconceivable as we study carefully the relations they sustain to each other, for substances so unlike as artificial dentures and the mucous membrane of the mouth are brought together nowhere else in the human body. . . .

The surfaces between the papillæ are filled with epithelial cells, which give to the mucous membrane an outwardly smooth appearance. The deepest portion of the epithelial layer is formed by a layer of protoplasm, and in this protoplasmic layer are found the youngest of the epithelial cells. In a normal condition there is a constant production of young cells and a subsequent desquamation of the oldest cells of the epithelial layer, which under ordinary or natural circumstances are floated away in the saliva. This exfoliation of the epithelial cells is a physiological process which in health takes place slowly; a too rapid shedding giving rise to pathological conditions; shallow ulcers, aphthous or canker, being caused by the shedding of the older or superficial cells faster than the young cells are developed.

The most favorable conditions for a too rapid shedding of these cells is established under artificial dentures resting on the mucous surfaces of the mouth.

All artificial dentures are poor conductors of thermal changes, excepting gold and continuous gum, which quickly become such by decomposed mucus, saliva and debris, and consequently the membrane of the mouth covered by them is kept at a higher temperature than when in a normally exposed condition. . . .

When the mouth is to a greater or less extent covered with a non-conducting substance, the heat conveyed to the surface is not radiated, a too rapid shedding of the epithelial cells is at once established, and congestion, inflammation, and not infrequently suppuration, quickly follows.

Cast off and decomposed or decomposing epithelial cells are in them-

selves irritating if permitted to remain long in contact with healthy tissue. With the surfaces of the mouth exposed, they are quickly floated away in the saliva in the act of mastication, or by the employment of some one or more of the hygienic apparatus in such general use. But with the membrane covered with an artificial denture, retained by atmospheric pressure so closely as to exclude the saliva, they must retain an irritating substance upon the mucous surfaces. Very frequent and very thorough brushing of the plate and mouth would seem necessary to protect the membrane from the morbid influences of these decomposed cells. . . .

The greatest care should always be taken when constructing and inserting them to see that pressure is equally distributed, so that the bearing shall be upon as large a surface as possible, ever remembering that the continued pressure or sucking necessary to hold the denture to the roof of the mouth, is not infrequently sufficient to cause congestion, inflammation, and sometimes suppuration. . . .

There remains yet to be considered one influence which is more fruitful in the production of pathological results than all others combined, namely, *mechanical irritation*, which may, and often does, cause organic changes, modifying the nutrition of the parts and giving rise to morbid alterations of structures. It is a well-known fact in pathology, that any long continued irritation may so alter the nutrition of normal structures and benign growths as to impart to them a semi-malignant or malignant type. The mucous membrane of the mouth is especially prone to organic changes under long-continued irritation. Simple hyperæmia, spasmodic stricture, labial epithelium *epuloids*, and tumors of various forms may and often do result from mechanical irritation. But undoubtedly most of the organic affections which primarily result from irritation, are the immediate results of inflammation, chronic or acute, which is itself the result of cell irritation. Tissues inflamed become morbidly sensitive, and mechanical and other irritants operating upon an excited sensibility are productive of still more irritation in a pathological sense, for whether chemical or mechanical it does not cease when inflammation supervenes.

It is easy, therefore, to understand how it is that pathological changes so frequently follow the wearing of artificial substitutes for the natural dental organs. Perfect adaptation of the case to the mouth is rarely or never attained, and the local mechanical irritation is in all cases probably far greater than is generally supposed. No mouth is of uniform density, yielding alike to pressure in all its parts, so that in the act of mastication the unequal pressure of the denture upon the mucous surfaces is in itself sufficient oftentimes to cause trouble, and is not infrequently the underlying difficulty in attaining the success our efforts should seemingly merit."

The Best Investing Material.

In answer to the query "What makes the best investment for plates or bridges, where gold soldering is to be done?" the following answers are given in the *Dominion Dental Journal*:

Dr. J. A. Bazin—"Four things have been commonly used as an investment (with plaster) in soldering teeth on gold, platina, or other metal, each one having its friends. Clean river sand, fine silex, fine soapstone and shredded asbestos. My preference has always been in favor of sand, two-thirds to three-quarters sand to one of plaster. In soldering whole sets, or when much of the arch is enveloped to prevent warping, I favor, at least, nine-tenths sand for filling the ridge portion. The special advantage of this material is that it is a good conductor and allows the heat to carry well through the mass of investment. Asbestos holds together somewhat better, but it takes much longer to heat up. Silex is apt to fuse on to the tooth, if strong heat is put on a certain point, and soapstone is less of a conductor than either. In the fifties I often cut fine binding wire in half-inch bits, and laid them as a second investment to prevent cracking in special cases, and for full sets had iron hoop rings for the same purpose; but then we had not the appliances that obtain at this time

Dr. R. E. Sparks—Equal parts of finely sifted coal ashes and plaster of Paris makes as good investment as I have tried, and is about as cheap and convenient as anything."

How to Vulcanize Rubber Plates between Metallic Surfaces.

Dr. A. N. Dick, in the *Items* says:

"The process which I employ is the following: After the teeth have been articulated and the model buried in the lower half of the flask, trim away all surplus wax from the palatal side of the teeth, leaving the model exposed.

Now take a sheet of good modelling compound, rolled to the thickness desired for the plate, dip it in hot water and adjust it to the model and teeth, using a spoon to pour on the hot water till it fits perfectly, so as to develop the ruga on the lingual surface. Then with a sharp instrument trim the edges and finish to the desired shape of plate. Moisten the surface and burnish on a piece of extra tough tin foil No. 4, first pressing it to position with a bunch of cotton or the corner of a soft napkin. Let the burnishing be done very carefully with a smooth round instrument.

I prepare my sheet of modelling compound by pressing it between two pieces of glass. In that way I secure any thickness that I desire.

In preparing the plaster for the mold, pour the required amount of water in the mixing-cup and sprinkle the plaster on the water without stirring, till enough of the plaster has settled down in the water to give the desired consistency; by so doing the air that is in the dry plaster will be floated out, so to speak, and not be carried in the mixture as it would be if the plaster was stirred from the beginning, thus securing a mold free from air bubbles. Then pour and let it set.

After opening the flask, pour a little hot water on the base-plate and lift it carefully from the underlying tin foil.

If these details are strictly followed by a skillful hand, the result will be a beautiful lingual surface that will require only the felt and brush wheels to finish it. The file and sandpaper will be needed for the margins.

To secure a metallic surface for the palatal side of the plate is equally simple, and I think, to the mind of the practical man, needs no explanation. However, I would suggest that the same care should be used in mixing the plaster for the model as for the mold, otherwise there would be air holes in which the rubber would be forced through the tin foil and thus make a rough surface. The foil for the palatal side should be No. 4, and the model should be wet when the foil is applied to it. The foil should be applied to the model with the thumb and fingers without burnishing, as the burnisher would injure the model."

Further Notes on Hydrogen Dioxid.

Dr. Henry Leffman contributes another article to the *Dental Cosmos* on hydrogen dioxid in which he says:—

"There is no need of further comparative analytic studies of all the commercial forms, and attention may be given to determining what constitutes a good quality of hydrogen dioxid.

The U. S. Pharmacopœia has fixed a strength of ten volumes, determined in a prescribed manner, and I see no reason for departing from this suggestion. It has lately been asserted that the preparation should be not less than fifteen volumes, but the statement was made merely dogmatically, and we are left to wonder as to what process of reasoning led to that opinion.

I have subjected to examination some specimens of hydrogen dioxid, selecting only those that previous analyses had shown to be of fair quality. I thought it advisable to examine samples from widely different markets,

and obtained them from New York, Chicago and St. Louis as well as from Philadelphia. They were all obtained through a retail druggist, and delivered to me in the original unbroken packages. I made, promptly after their receipt, a determination of the volume of available oxygen, using the permanganate method. . . .

The tests extended over a period of four months. McKesson and Robbins preparations were about 10 volumes, or in accordance with the U. S. Pharmacopœia the deterioration was slight and amount of acid in combination found to be only from 2.5 to 2.8.

Oakland Chemical Co's gave almost as favorable results, but there was slightly more acid. Marchand's preparations showed from 12 to 14 volumes, with deterioration from 12.7 to 8.5 volumes, and from 5.5 to 16.0 acid. Squibb, (N. Y.), showed 14.3 volumes and 53.0 acid. J. Robbins, London, showed 4.9 volumes and 48.5 acid. Continuing, Dr. Leffman said :

Concerning the medicinal aqueous solutions of strength above twelve volumes, I deem it proper to say that two cases of serious explosion have been reported to me verbally ; in one of these a well-known surgeon narrowly escaped the loss of his sight, and in the other a sample bottle exploded, shortly after an agent of the manufacturer had left it on the table in a doctor's office. I have scarcely ever opened these strong solutions without getting evidence of high internal pressure, and the brand of Oakland Chemical Co. rarely gives any evidence of pressure, and the brand of McKesson & Robbins shows no pressure at all."

The Uses of Salol.

Dr. R. M. Sanger read a paper before the Odontological Society of Pennsylvania which has been printed in the *International Dental Journal*. He says :—

"As a root-filler, salol is manipulated in this manner: Having the rubber dam adjusted, the cavity dry, and the canals sterilized by any of the various methods at our command, the root is thoroughly dried with an Evans root-drier, and the salol crystal placed in the cavity with a flat spatula or an amalgam carrier. The hot root-drier is then passed through the powder, which immediately melts and follows the instrument into the canal, following by capillary attraction beyond the point where the instrument stops. Repeating this once or twice, the canal will be entirely filled with the liquid salol. A warm tin or copper canal-point is then introduced, and carried carefully as far into the canal as possible without passing through the apex. It is then left for a few moments to

cool, when the canal point will be found to be solidly imbedded in a crystalline, antiseptic mass which entirely fills the canal. If the cavity is so situated that the crystals cannot be readily placed in position, the salol is first melted in a test-tube, care being taken not to heat it more than just enough to liquefy the powder. Then by the use of a glass syringe, slightly warmed, the salol is placed in the cavity, and carried to the end of the canal by the use of the root-drier as before.

I have yet to record a single failure from this use of this material, and I believe it to be as near the ideal root-filling as anything yet offered to the profession.

If from any cause we should desire to remove the filling, a warm instrument held against the metal point will quickly heat it through, causing the salol to melt, and the whole can be readily washed out of the cavity with alcohol without any undue pressure or irritation to the sore tooth.

Just a word here regarding these little glass syringes. They are made of blown glass, and may be heated over an alcohol or Bunsen flame, and the point bent to any desired shape without fear of breaking if care be used when the heat is first applied. They are very cheap, costing about one dollar per dozen, and will be found extremely useful where a syringe is needed.

We frequently have cases presented where the teeth have decayed to such an extent that to remove all the infected tissue would expose the pulp, and to leave it would almost certainly insure exposure and trouble from recurrent decay unless thorough sterilization can be secured and maintained. Let us suppose the case of an inferior first permanent molar. Having adjusted the dam, dried the cavity, and removed as much of the infected material as the condition will admit, sterilizing the remainder as thoroughly as possible, by the use of whatever non-irritating germicide the operator may prefer, the cavity is then thoroughly dried, and the crystals of salol placed in with a flat spatula, and melted by passing over it a smooth, flat burnisher or amalgam plugger warmed sufficiently to liquefy the salol without causing pain to the patient. The less heat used the more quickly crystallization takes place again, which should occur in three or four minutes at the longest. We have now sealed the floor of the cavity with a firm mass of antiseptic material capable of receiving considerable pressure without inconvenience to the patient. This is far from being a non-conductor, however, and should be covered with a layer of cement before the final filling is inserted.

In treating an upper tooth under similar circumstances the only difference would be the manner of introducing the salol. Here we take a piece of asbestos felt, cut to fit the floor of the cavity, warm it over a

spirit lamp, and place it against the salol crystals, which have been placed on a glass slab for that purpose. Immediately the salol is melted and taken up by the asbestos, until it is more than saturated. It is then placed in the cavity, and, upon cooling, we proceed as before, not forgetting the cement, however, as the asbestos thus treated does not give a non-conducting surface.

Where the pulp is actually exposed, and we desire to cap it, remove as much decay as possible around the edge of the exposure, and saturate the floor of the cavity with oil of cloves or cinnamon to relieve the pain, if any be present, and sterilize the cavity. A small disk of platinum, about 32 gauge, is then cut to fit the floor of the cavity, and the centre depressed with a ball burnisher, thus forming a metal cup. A paste is made of carbolic acid, oxid of zinc, and vaseline, with which the cup is filled, and placed gently over the exposed pulp. The crystals of salol are then placed over the cap and liquefied by passing over them a warm, flat burnisher. In a few moments the cap and floor of the cavity are hermetically sealed, and the tooth is ready for filling.

Salol is readily dissolved by any of the volatile oil, or alcohol. All surplus should be carefully removed, from around the edges of the cavity and the outside of the tooth, as it is irritating to the mucous membrane, and will make an abrasion somewhat resembling a canker if left in contact with the gum. This sore is not dangerous, however, and will heal in a day or two, the healing being hastened by the application of vaseline.

Simple Method of Cleaning Impression Trays.

“Give the impression trays a coating of sweet oil with a woollen cloth dipped in the oil. Put them in strong soap-suds (made with soap shavings or powder), boil, and wipe dry. Now polish with whiting by using a soft woollen cloth or fine leather. In this way you can keep your trays bright and clean, and the plaster will not adhere to them.”—*E. B. Edgers in International.*

Action of Light on Tr. Iodi.

Popel finds that after exposure of samples of tincture of iodine (1 in 12) to diffused daylight, in two months a loss of 0.68 per cent. of iodine took place, while in a dark place the loss was 0.816 per cent. The difference was accounted for by the decomposition of the hydriodic acid, ethyl iodide, and iodoform formed by the action of light again yielding free iodine.—*Amer. Druggist.*

The Etiology of Green-Stain.

Dr. C. T. Gramm presented an interesting paper on this subject, before the New York State Dental Society. From the article as it appears in the *Dental Cosmos*, we make the following abstract:

"No special class of patients or of teeth is exempt from green-stain, but it most frequently found on pitted, grooved, or markedly striated enamel-walls of incisors and cuspids and in unclean mouths.

As a rule, I have found erosion underneath green-stain associated with (1) exanthematous impress upon the teeth; (2) with a measure of constitutional degeneracy, congenital or post-natal, affecting the nutrition of the tooth itself and the fluids of the oral cavity.

Since, however, these are precisely the circumstances under which erosion *without* green-stain is found, it cannot be held that green-stain *per se* is responsible for the erosion in such cases.

Among eighty-five adult Russian Jews, in many of whom degeneration was marked, I found fifty-seven cases of green-stain. Of these, three cases showed erosion associated with the discoloration. There were, however, eleven cases of typical erosion without any stain whatever. In fifty-four of these cases of green-stain the discoloration was readily removed with H_2O_2 , and the enamel-wall, after probably years of discoloration, left perfectly polished and translucent.

Out of 1200 stained permanent largely carious teeth, which I found in the various "dental parlors" of this city, less than three per cent. showed erosion of the enamel; this too, in face of the fact that the patrons of those institutions are not especially given to the care of their mouths, and a goodly proportion of them are poorly nourished.

At Dr. Rosa Engelman's large children's clinic at the United Hebrew Charities Dispensary, which I had the privilege of attending twice weekly and at which I made notes of over eighty cases of green-stain the percentage of decalcification was unexpectedly small. I found but six cases suggesting erosion, and these were notably among children of rickety, tuberculous and neurotic diathesis. This in face of the observation of Professor Truman, 'In young persons it has invariably been shown to be accompanied by decalcification.' . . .

I doubt, in the first place, whether the partaking of any one kind of food has aught to do with the product under discussion. My own clinical records, at least, do not suggest it.

The cause of non-recurrence lies more probably in the polishing away of the cuticle, to which alone green-stain takes kindly. . . .

My clinical experience and that in the biological laboratory leads me to support the proposition that green-stain is a chromogenic phenome-

non attending, under certain conditions, some form of bacterial life within the mouth. . . .

The only instance in which I was able to produce green-stain upon a sterilized tooth which had shown no trace of it before the experiment was by associating it with a stained tooth in a tube with saliva and sugar. The green-stain, though very slight, accumulated at the line of the gingival margin on the enamel, which had suffered some slight decalcification before an injury while being extracted.

My attempts to artificially produce the stain on culture media have so far been unsuccessful. Morphologically, all the varied stages of the growth, if we accept the pleomorphic theory, and the various species of bacteria which I found in scrapings of green-stain, were represented in my cultures. Not, however, until I resorted to the peptone-sugar-starch bouillon with a sterilized tooth suspended in it, and here I made an interesting observation. Within forty-eight hours a pure rich development of streptococci, which sank to the bottom, appeared in the liquid, which had become acid. The enamel-walls of the four teeth which had been suspended in the flasks were laden with heavy growths of Miller's *Leptothrix innominata*, *Bacillus bucculis maximus*, *Leptothrix buccalis maxima*, *Jodococcus vaginatus*, of the cultivation of which Miller says, 'They have all the peculiarity that they will not grow on any of the usual culture-media. . . .

The deposit on these teeth resembles the common *materia alba* in color and consistency, while the enamel, due undoubtedly to the acid condition of the bouillon, suffered a superficial decalcification and became of brownish color, very like that often seen in incipient decay on the approximal walls of teeth.

I repeated the experiment with bones of varied densities and with c. p, phosphate of lime in simple bouillon. The broth became putrid and the bacteria assumed a different character in each of the flasks, though inoculated from the same tooth and the same scraping; while the deposit of one flask was granular, that of another was thready and slimy, while that of still another had a tendency to accumulate in cheesy balls. I mention these tests to indicate how varied conditions, however slight, may influence morphology, character, and life of most bacteria.

To summarize, then, clinically, green-stain may be considered innocuous.

It most frequently exists without causing erosion, if there be no congenital impress or post-natal constitutional degeneracy.

It may be considered a chromogenic phenomenon, since we know chromogenic bacteria exist in the mouth, and it is reasonable to suppose

that green-stain should become diffused throughout the enamel-cuticle, where, in grooves and pits, it may find shelter for itself and its producers."

Suggestions on Crown and Bridge-Work.

In an article on this subject in the *Dental Review*, Dr. F. B. Kremer, says:—

"At the present time, in my practice, six teeth including piers, is the limit of a fixed bridge, and then only in cases where I have a normal occlusion and a depth of space sufficient to enable me to make the bridge easily and thoroughly self-cleansing.

By depth of space I mean cases in which either the crowns of the remaining teeth are long, or absorption after extraction has been sufficient to enable me to make the dummy teeth strong enough to bear the strain of mastication and long enough that they may present lingually a continuous oval surface to which food cannot cling, or between which and the gums food cannot become impacted.

Where the crowns of remaining teeth are short, much abraded and in square bites a fixed bridge is usually a failure after a few years' use owing to the difficulty in such cases of securing proper self-cleansing spaces, and at the same time the requisite strength for purposes of mastication. In all such cases a removable bridge is preferable, using telescope crowns made of gold alloyed with platinum or iridium, thus securing the maximum strength with the smallest amount of material. A removable bridge is not only indicated in the class of cases just mentioned, but also in all cases where the teeth are not firmly articulated, or where there is much deviation from a normal occlusion.

In the class of cases last mentioned the danger of fracture of porcelain facings is greatly increased and knowing the difficulty of repair it is best to have a denture that can be removed from the mouth in case of accident. In almost any case a removable bridge is preferable in the end to a fixed bridge.

It is true that a much higher degree of skill is necessary in the construction of removable bridge work to secure successful results than in fixed bridge work, but not so high as to unattainable. I would earnestly commend to you a careful study of removable bridge work with the assurance that the more familiar you become with its uses and possibilities the better you will like it.

The breaking of porcelain in fixed bridge work, even where the occlusal surfaces have seemingly been thoroughly protected with gold, has been a source of much annoyance, and many directions for repairing the

damage have been given. I think I can make suggestions that will be of value to you.

The idea is, I believe a cure for the evil because it reaches the cause of our trouble, namely, imperfect articulation. Seldom have I seen a case of bridge work where a proper articulation had been secured.

A lateral movement of the jaw with correct articulation is an impossibility in plate work without the use of a Bonwill articulator. This knowledge caused me to look into the question of breakage in bridge work from the standpoint of articulation and the result of my investigation was truly surprising. So much so, in fact, that I am almost prepared to say without reservation, that metallic occluding surfaces are not a necessity in the molar and bicuspid teeth, provided a proper occlusion has been secured by the application of Bonwill's law of occlusion to the construction of bridge denture. At the present and for some time past, I have been following the suggestion I have just given you with the most gratifying results. It may at first seem somewhat difficult to grind the dummy teeth to meet the requirements of this but it can be easily accomplished after a little practice.

Another of my early troubles was caused by the failure of shell crowns used as anchorages to stand the stress brought to bear upon them. They would sometimes be torn or broken down where the bridge was soldered to them. I have entirely overcome that annoyance by doubling the band half way round on that side. After making the crown and fitting it to the tooth or root I bend a strip of gold of a width equal to that of the band and reaching partly up over the occlusal surface soldering it the crown, thus securing two thicknesses of metal instead of one where strength is most needed."

The Nature of the Transparent Zone of Dental Caries.

Regarding this transparent zone Mr. F. J. Bennett states that "a true knowledge of the nature of this appearance was desirable, not only in relation to dental caries, but also as throwing light on the properties of dentine itself. For should the zone of transparency prove to be a manifestation of a physiological activity of the living parts of dentine, that structure would be brought into much closer affinity with the other tissues of the body than would be possible to ascribe to it otherwise. The evidence which he would place before them might be considered as the outcome of an enquiry on his part as to how far the zone of transparency favored the view of vital activity in response to the stimulus of caries, or the reverse. Dentine in this condition had formed the subject of so

many able and well known enquiries on the part of others, that he could do no more than summarize the results. The opinions generally resolved themselves into the question: 'Is the transparency due to increased calcification of the part or not?'

A number of slides were shown from which Mr. Bennett found support for the following conclusion, stated in his own words: "Inasmuch as enlarged and thickened tubes can be demonstrated in parts—I do not say in every part, and in all cases—we cannot regard the zone of transparency as an area of increased calcification, and that the phenomena point to the zone as representing a precursory stage of dental caries."—*Extract Brit. Journal.*

Elements of Success in Dental Practice.

In an article in the *Dominion Dental Journal* Dr. Wm. Bruce says:

"Attention or inattention to little things makes the difference between success and failure. We cannot afford to overlook our duties to our patients. It is necessary that we make a study of our personal presence and surroundings on those who come within our reach, doing all in our power to make things pleasant for those who wait on us, such as a strict observance of cleanliness, which is akin to godliness, as to our clothing, hands and our instruments, etc.

A dingy, dirty office, the effluvia of unclean spittoons, or an untidy appearance, is certainly very offensive; but if there is anything more offensive to a patient than another it is unclean hands and a foul breath, which is often the result of the use of claret, tobacco, etc., neither of which should be used by the ideal dentist. It is necessary, too, that we provide an attractive reception room, comfortable and airy, allowing nothing there which would remind one of being in a dental room.

The operating-room and laboratory should be well appointed, too, and provided with everything necessary for the best work, having a place for everything and everything in its place, thus holding ourselves at all times prepared to give our patients the kind of treatment they need. In order to do this we must read and keep posted in all the latest discoveries, and, so far as possible, furnish ourselves with the latest and best improvements.

A high sense of right should guarantee faithfulness in the performance of all operations. We should encourage dental education in the community, disseminating correct views of the power of dental science and art. We should talk familiarly with our patients, giving a civil and intelligent answer to their questions (even though they may sometimes

be ridiculous), instructing them in general principles, and bringing them to realize the need of a skillful dentist possessing a knowledge of science and art."

Concentrated Solution of Phenol.

It is well known that glycerin increases the solubility of phenol in water, but the strong solution is very caustic. Sulphuricinate of sodium is claimed (*Journal de Pharmacie d'Anvers*) to be of great value in aiding the solubility of this body, since it will maintain 40 per cent. of phenol in solution without destroying its antiseptic power, and yet without causticity. As its name implies, it is a product of castor oil.

Hygiene of the Teeth.

In a communication to the Berlin Medical Society, Dr. Ritter reported that after having examined the teeth of 637 persons, more than half of whom were under 15 years of age, he found only 4 with sound teeth. On this basis the number of individuals with their teeth in good condition is only about 6.2 per 1000, which shows how necessary is a scrupulous hygiene of the mouth and teeth.—*Jour. de Hygiene*.

To Remove Oil of Cassia Stains.

The *Dental Review* states that :

"Ozonized oil of turpentine will dissolve the stains produced by the oil of cassia when it is left too long in a tooth. Wash the cavity afterward with chloroform and repeat if necessary."

Obituary.

THOMAS H. CHANDLER.

THOMAS H. CHANDLER, A.M., L.C.B., M.D., D.M.D., Dean and Professor of Mechanical Dentistry in the Dental Department of Harvard University, died at his residence in Boston, on Tuesday, August 27, 1895, aged 71 years.

Dr. Chandler was born in Boston, and was the eldest of a family of five brothers. Graduating from the common schools he entered the Latin School, graduating with honors, then entering Harvard University, graduated from that institution. Entering Harvard Law School, he graduated from it in 1853. In 1858 he began studying dentistry and later studied medicine. In 1869 he was elected adjunct professor of mechanical dentistry of the Harvard Dental School, and in 1874 became its dean. Translations of two large works on dental caries, one by Leber and Rotenstein, and the other from the French, by Magitot, were the chief events of his literary career.

Dr. Chandler, was one of the representative American dentists, and in his death the dental profession loses another of its pioneers.

Dental Clinic.

THE great success of the clinic conducted by the Alumni Association of Chicago College of Dental Surgery, at its last January meeting, has determined the association to repeat that program on an enlarged scale at the coming January meeting; making a two days' session instead of one, and considerably enlarging upon the social features, so thoroughly appreciated last winter. The spacious rooms and the up-to-date equipments, makes the college building an ideal place to conduct clinics of all kinds. They are arranged to be instructive and satisfactory, not to a few alone, but to all in attendance, and the best clinicians in the country will participate. Extended notice will be published later.

Ohio State Dental Society.

THE annual meeting of the Ohio State Dental Society, to be held in Columbus, on December 3-4-5, promises to be one of great interest. A good program is being prepared, and essays and clinics of special value will be given. Mark off these dates and attend.

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CONTRIBUTIONS.

The Use of Compressed Air in Dentistry.*

BY S. FREEMAN, NEW YORK.

THE dentist, who is called upon to treat and relieve the pain of such delicate and sensitive structures as the teeth, which bear an intimate anatomical and physiological relation to some of the most important organs of the body, should naturally look forward to that which can assist him in the practice of his profession. It is therefore essential to his success that he be provided with all the necessary appliances which will aid him in his operations and mitigate the sufferings of his patients.

With this aim in view, no procedure appears to me to be more conducive to success than the application of compressed air, an agent which I employ extensively in operative dentistry, and it affords me great pleasure to call your attention to the divers instruments which are in use, and the application of which I will explain and demonstrate in detail.

Permit me to explain the methods of producing compressed air and the manner of conducting the same to your operating chair. It is obtained by means of a suction pump which sucks in the air and forces it through a pipe to a reservoir, as it is

* Abstract of a paper read at the American Dental Association, Aug., 1895.

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necessary for our purpose to have a continuous and considerable current. I would not advise the use of a hand pump or small cylinder, as in employing them you will find that both the air and the operator become quickly exhausted. I would therefore recommend that which is known as the champion beer pump or the compound pump of the same manufacture, for I find them both the simplest in construction as well as the most satisfactory air compressors on the market to-day.

Before placing the pump in your office, ascertain how many pounds of water pressure you have; if, as in my office, you have only twenty pounds, the champion pump will not furnish, contrary to the claim of the manufacturers, the same amount of air pressure as water, as there is, as I have discovered, a loss of a few pounds; such being the case, the compound pump (although a few pounds of pressure are also lost (is preferable as it is frequently necessary to have the air at a pressure of forty to fifty pounds to the square inch.

This pump is connected with the reservoir, which is a tank containing eighteen gallons of air tested to one hundred and fifty pounds pressure to the square inch; from this runs a quarter of an inch block-tin pipe, with branches to my laboratory and operating room; to this pipe I have attached a regulator and a gauge, the regulator being nothing more than a screw valve, as you loosen the screw you close the valve, and *vice versa*. From the regulator a pipe leads to the gauge, which indicates the number of pounds pressure. I use the one hundred pounds gauge, as it enables me to ascertain the maximum amount of pressure in my office. The pressure generated by the compound pump is sometimes so great that a lower gauge will not register it. To the gauge is connected a distributing pipe with three small cocks to attach the rubber tubes and the cut-off. The tubes should be of heavy rubber so as to withstand a high air-pressure. The cut-offs close automatically.

In the practice of dentistry it is absolutely necessary to have the mouth in an antiseptic condition; to produce this effect no doubt many of you use the hand atomizer, which, by the continuous pressure of the bulb, causes a slight cramp in the hand; with the compressed air apparatus we do away with this work, you have the tube steadied, and can thoroughly cleanse the mouth or any cavity. I derive excellent results from the following prescription:

R	Borine	-	-	-	-	-	-	1 part.
	Pyrozone Med. 3%	-	-	-	-	-	-	2 "
	Water	-	-	-	-	-	-	1 "

This makes an agreeable mouth-wash, applied with a spray.

No doubt you have frequently met cases where you would prefer to place on the rubber dam, but owing to the patient's inability to breathe through the nostrils, you were compelled to send your patient away or otherwise work at a great disadvantage.

How often have you cast about for a remedy? It is a simple one; a two per cent. solution of cocain placed in an atomizer attached to your compressed air apparatus, which is gauged at ten to fifteen pounds pressure, and the spray thrown into the nostrils will invariably relieve that posterior nasal catarrh or reduce the swollen tissues of the nares to such an extent that you can proceed with your work in a few minutes without any inconveniences to your patient. In using the spray for this purpose, have your patient sitting upright in the chair, the head inclined slightly forward: Insert the tube horizontally into the nares and do not apply over ten to fifteen pounds of air pressure, as otherwise you may set up an irritation of the middle ear. In stomatitis of the various kinds, the spray employed with a high pressure produces excellent results. In aphthous stomatitis, which usually requires about a week to ten days to heal, I have succeeded in obtaining a cure in two days. Probably the citation of the following cases will enable you to understand the value of this agent.

Mr. H., age 17 years, applied to me for treatment May 7th, 1895, suffering from large grayish patches, situated on the lower and upper lips. These patches were very painful. I applied the following prescription:

R	Pyrozone Med. 3%	-	-	-	-	-	3 iv.
	Borine	-	-	-	-	-	3 ii.

with my atomizer under forty pounds pressure. In about two minutes it produced bleeding of the sores, washing away the grayish patch, and you could see the ebullition of the pyrozone, leaving escharotic spots similar to those produced by the application of the caustic pyrozone. I gave the patient the mouth-wash recommended by Dr. Sudduth, of pyrozone and soda mint. The patient reported on the 9th day of May, having no sign of the patches. This method of treatment was not painful

and proved very efficient, as I have used it in similar cases with uniformly good results.

A patient affected with mercurial stomatitis presented himself to me on June 5th, 1895. I found that characteristic lesion of the edges of the gums with considerable pyalism, which excoriated the corners of the mouth, and was informed by the patient's physician that sometime previous to the appearance of this disease, the patient had been taking mercury, three times a day, for three months, and, during this medication, he would discontinue the use of the drug as soon as the teeth were sore to the touch. He was having his teeth attended to by a fellow practitioner, who, having learned his condition, upon the appearance of this lesion, treated the parts locally with glycerole of tannin and iodine, using as a mouth-wash, Listerine. After treating the patient for three weeks without success, he concluded that it was secondary syphilis, and sent the patient to his physician for treatment. The physician, recognizing the condition as a mercurial stomatitis, referred the patient to me.

I used the pyrozone med. 3% on the diseased parts, with a spray gauged at thirty pounds pressure, and gave him for a mouth-wash: Pyrozone med. 3% ; borine ; equal parts.

When the patient applied to me, he could not eat his food without pain. The next day he reported, stating that it was the first time in some weeks that he enjoyed eating a meal. After three treatments, with the pressure increased to fifty pounds, I found a decided improvement in the condition of the mouth.

The sloughing of the edges of the gum disappeared after the first treatment, and in four days the gums were in quite a healthy condition. At this time the patient was called away from the city, and I have since learned that the tissues are in a perfectly healthy condition. Before applying any medicines to the gums, it is always necessary to have a dry surface, so that the medication may be readily absorbed and not distribute itself over the surface of the tissue.

I found it somewhat difficult to obtain a dry condition of the gums in the posterior portion of the mouth before employing this apparatus. Now I find it a very simple matter. By drawing back the corners of the mouth with a napkin or piece of cottonoid, and throwing the compressed air directly to the spot, it requires only a few seconds to procure the desired condition of the mucosa,

and upon applying your medicines, you get immediate absorption.

Now, I again have recourse to the air pressure, which seems to drive the medicines deep into the tissues.

In periostitis I prefer to use the cold air current, which in itself gives relief to the patient.

In this manner the application of counter-irritants, sedatives, and local anesthetics is made easy. With cocain you do not obtain as deep an anesthesia as you do by the hypodermic injection of the drug; with a four per cent. solution I was enabled to leave abscesses within twenty to thirty seconds without pain, and I have produced with a ten per cent. solution sufficient anesthesia to extract teeth, and did not observe the toxic symptoms which you frequently have following an injection.

In the treatment of pyorrhea alveolaris, it is absolutely essential that every particle of deposit of whatever form shall be removed, and that the debris shall be thoroughly washed away, leaving no particles to be ulcerated out; to do this it requires a vigorous stream of water.

Dr. J. N. Farrar introduced for this purpose a set of four syringes, with delicate points. I use this bottle, attached to my compressed air apparatus at fifty to sixty pounds pressure, which throws a stream with such a force as to entirely cleanse the parts; then I use the Davidson spray tubes, filled with pyrozone med. 3% and borine, equal parts, which throws out such copious spray that it lifts the gum tissues away from the teeth, introducing the medicament directly to the seat of trouble, forcing away all foreign particles and giving a clean antiseptic condition of the parts.

It has been demonstrated that when the water is removed from a tooth, the normal function of transmitting impressions seems to be modified. This dessication can be accomplished by several agents, heat, cold, and chemicals. We know that heat or cold will produce pain, and in the application of either we should proceed with extreme caution.

I use a hot air syringe similar to the S. S. White No. 30, only it has twice as large a cylinder. The chamber is filled with carbon, which is found to be one of the best materials for retaining caloric, and only requires a few minutes over a Bunsen burner flame to accomplish the requisite amount of heat. With these syringes attached to the compressed air apparatus, you can so

regulate the flow of air that in from one to five minutes you have your teeth thoroughly dry ; then introduce your medicine heated to about 95° F., and then applying your warm air current with about forty pounds pressure, you will be able to excavate your tooth without pain, nor will you have any subsequent irritation. With this method it is not necessary to employ acids in introducing your cocain, nor is much of your valuable time wasted waiting for the absorption of the medicament. You can also spray your medicines into a tooth, but I would first advise the dehydration of the dentine.

In the bleaching of teeth, I find that by the application of hot air at a high pressure, I am able to produce the required condition in one-half the usual time, as you rapidly evaporate the pyrozone 25% and force it into the tubuli.

It is necessary to be cautious in bleaching teeth so as not to get them too white, as you will frequently observe them somewhat lighter colored on the following day.

In making a tooth perfectly aseptic, the same method of applying your drug as I have recommended in inducing anesthesia, will give you a reliable antiseptic condition of both tooth and root.

In setting in pivot teeth, we often find it very difficult to carry the cement to the upper portion of the root.

In forcing it into the root canal with a dry instrument, upon withdrawal of the latter the cement is found adherent to it and not to the walls of the root ; but with a high pressure you can force it into every irregularity of the root, while at the same time the compressed air will dry all the surrounding tissue and you avoid the necessity of wiping away the moisture excreted by the mucous glands

An Incident of Laboratory Practice—Babbitt-Metal.

BY L. P. HASKELL, CHICAGO.

MORE than forty years ago, while engaged in carving and mounting block teeth for the profession in Boston, a dentist from a country town called with models of upper and lower jaws, and wished me to swage gold plates, carve and mount the teeth. He

gave me no bite, no guide whatever as to relative position of the jaws, the length of teeth, etc.

I told him were I to do it the set of teeth would be worthless, and advised him to take the models home, form some sort of plates, and take a bite. Two days afterward he returned the models, saying he could find nothing to form the plates from and sent no bite, but told me to do the best I could.

I obeyed instructions, and having arranged waxes for the carving models without any guide, carved and mounted the teeth, sent them C. O. D., and heard nothing from them. Six months later he called. I asked him how that set of "guess-work" teeth worked. He said, "Splendid; didn't have to do a thing to them and the patient left town satisfied"!! If any one has an "incident of office practice" to match this, bring it on.

A few things to be remembered in the use of Babbitt metal. While it is the only metal which has all of the requisites for a dental die, viz., non-shrinkage, sufficiently hard not to batter, sufficiently tough not to break, and making a smooth die, it must be made from a proper formula. In order to cheapen it for the purposes for which it is generally used, lead is substituted for the tin to a greater or less extent. This ruins it for *dental* dies. The proper formula which I furnished the dental goods manufacturers many years ago, is 1 part copper, 2 parts antimony, 8 parts tin.

Whenever a die cracks in swaging it shows that there is a lack of tin. Overheating of this metal injures it, because of the tendency of tin to oxidize.

Pure lead cannot be used as a counter die, because of its melting at a higher temperature than the Babbitt and adheres to it. The melting temperature of the lead is reduced by the addition of tin—5 parts lead, 1 part tin. This should not be poured hot as it comes from the heater, but stirred until it begins to thicken and then poured quickly.

Being the first to introduce this metal into the laboratory 45 years ago, after several years use of zinc, type-metal, etc., I have never had occasion to use anything else since. It has greatly simplified the fitting of plates to the jaws.

A Method of Root Filling.

BY CARL E. KLOTZ, ST. CATHARINES, CAN.

A METHOD that will completely obliterate space, and one that I have used for a number of years, is to fill the root canals with chloro-percha and asbestos fibres.

The fibres can be got into canals into which it is impossible to get a gutta-percha cone. As they are very fine and will not fall under the instrument, they consequently will not clog up the canal before you have them up as far as required.

Reader: Do not think that you can do the same with fibres of cotton, because you cannot. Another advantage is, that you can pack the asbestos much more firmly than you can the cotton, and also you have an indestructible material in your root filling. Try it, but don't forget to wipe your instrument before introducing it again into the canal, otherwise you will, in withdrawing it, pull out the chloro-percha and asbestos you have put in. A smooth Donaldson Nerve Broach, with the point cut off, is the best instrument for filling canals as above.

The Necessity of and Methods for Better Pulp Protection in Filling Teeth.*

BY J. D. PATTERSON, D.D.S., KANSAS CITY, MO.

IN considering this subject no reference will be made to pulps which have become exposed or are in a pathological condition from near exposure, but to fairly deep-seated cavities in the teeth of patients under twenty-five years of age, which are usually filled with the prevailing materials without any endeavor to prevent pulp irritation, the operator believing that no considerable trouble will be possible either from the presence of a filling with the property of conducting thermal changes, or from the irritant nature of other filling materials in common use.

In this class of cases every observant practitioner has had

* Abstract of paper read at American Dental Association, Aug., 1895.

his attention directed to the number of pathological conditions arising in after years from death of the pulp. Where there is soon occurring trouble after the insertion of a filling upon a nearly exposed or pathological pulp, the removal of the filling and usual treatment finds immediate cure, but where the pulp death comes from long continued, generally imperceptible irritation, the danger is greater."

Dr. Patterson presented two cases for the consideration of the society. The first, showed the loss of five teeth and the surrounding process in the mouth of a young lady aged 20, from the death of a pulp under a gold filling in a lateral incisor. The filling was inserted thirteen months before the inflammation began. Some irritation through thermal changes was felt after the insertion of the filling, which soon subsided.

"When I first saw the case, only four days after the inflammation began, the lateral, central, and two bicuspids could be removed with the thumb and finger, and they were at once removed, as the process in the vicinity of these teeth was stripped of periosteum. When the trouble first showed, the lateral was drilled into and mummified pulp remnants were found. Vast quantities of pus followed rapid swelling. The most persistent surgical treatment was instituted, but without avail. The cuspid had to be removed on the sixth day. After extraction of the teeth the inflammation abated somewhat and after three days more the process, piece after piece, sequestered and was removed. All of this resulting from a small gold filling in the lateral which did not approach the nerve half way through the dentine.

The second case was almost a parallel one, save that the death of the pulp resulted from a cement filling inserted in a central incisor seven years before. Both patients were found to be free from hereditary taint.

As a protective capping gutta percha stands in first place. However, it cannot be used save in deep cavities where there is room for a good layer of cement over it upon which to condense gold.

Non-cohesive gold is advocated for deep-seated cavities, for it seems to be less of a conductor of heat and cold than the cohesive gold as condensed with a mallet. The reason of this is because a non-cohesive filling is in no way a cohesive mass, cannot be welded together and when a cavity is filled with a layer

after layer of this gold the thermal shock is conducted along the layers and not down to the bottom of the cavity, for there is no intimate connection between the different particles of the different sheets.

In this material we have an admirable pulp protector. A pad of sufficient thickness made by doubling strips upon each other and burnished over the pulp, has in my hands secured the best results.

Experiments in Immediate Root Filling.*

BY DR. J. S. KING, PITTSBURGH, PA.

IN this effort to discuss the subject, feeble though it be, please allow me the free use and meaning of the word discrimination. In the course of a general practice of dentistry, cases are found in which immediate root filling should be termed malpractice, if hastily persisted in.

In as few words as possible I will attempt to give some of my more recent experiences in the use of medicaments in treating pulpless teeth. First, permit me to state some of my earlier experiences in the treatment of pulpless teeth, which were results that came from teachings received on the subject, or perhaps I should say they were results that came from the absence of teaching on the subject.

In the years 1848 and early fifties, my rule of practice was to let alone or extract pulpless teeth and roots. Such treatment was in most cases final, and when extraction was resorted to it was both effectual and final, except in cases wherein breakage materially interfered with my finalities and the comfort of my patients.

In 1852-3 I became convinced of the error of an indiscriminate extraction of pulpless teeth and roots, in lieu of proper treatment for their preservation. In the treatment of such teeth the agents then made use of were few and simple, viz, a combination of carbolic acid and oil of cloves. This combination of remedies I inserted into each root as far as possible, repeating the insertion every three or four days, making in all from three to seven and

*Abstract of paper read before the joint meeting of the Lake Erie Dental and Pittsburgh Odontographic Societies, 1895.

eight insertions, as I deemed the requirements of a case seemed to demand in each separate case. I then proceeded in each instance to fill the pulp canals with fibers of cotton wet in carbolic acid, pressing the cotton as near the end of each root as possible, and then filling the cavities of decay temporarily with cotton dipped in sandarac varnish, or in some instances with white wax and wait a few days for results.

Let us leave the early '50's and come down to the early '90's wherein my experimentations in the matter of immediate root filling were more fully conducted. My experiments have convinced me that a large majority of pulpless teeth, met with in a general practice, can be successfully treated and preserved for future use at the first sitting of the patient.

The first thing to accomplish is a correct diagnosis of the case in hand and decision as to the method of proceeding. In some instances constitutional idiosyncracies and tendencies are met with that must be taken into consideration and respected. For instance, where a marked strumous condition of the general physical system of the patient is apparent the mucous surfaces of the throat and buccal cavity clearly indicate the presence of scrofula or the taint of syphilis, or a low grade of unhealthy pus is seen to exude from the sockets of pulpless teeth. Such conditions require a more prolonged course of local treatment and in connection therewith, in some cases, a proper systemic treatment of the patient.

First, remove from the cavity of decay all foreign matter and disintegrated dentine. Apply rubber dam, cleanse as far as possible from the pulp canal all pus and other debris and wash the cavity of decay and pulp canal with alcohol. Wipe dry the cavity of decay and pulp chamber, and enter upon the labor of a prolonged dessication of the crown and root, using heated air until well dried. This puts the dentine in a condition to take up by absorption as much creosote as will enter the doubtful tubuli; neutralizing by the use of creosote any septic material that may remain in the root after treatment. The root thus prepared is in readiness to receive the material.

In root filling I have experimented with several combinations of materials and have met with encouraging success. In my experimentations I used in a number of cases a combination of iodoform and camphorated carbolic acid, with good success. In other

cases I used a mixture of iodoform, zinc oxid, and wood creosote, with success. In other cases I made use of a combination of iodoform, zinc oxid, and salol; moistened with wood creosote. This combination of materials has given me much satisfaction. My later experiments were made by using only zinc oxid and salol, moistened with wood creosote. These later experiments were of so recent a date as to cause me to wait for results of such action before stating the percentage of success. By way of reply to questions that have been put to me at sundry times and places, such as why use iodoform and camphorated carbolic acid, my answer is, iodoform and its odor are antiseptic, carbolic acid is an antiseptic. Why use zinc oxid? Zinc oxid is an inert body, and when moistened with creosote or carbolic acid and placed within the pulp chamber becomes in a degree crystallized in that position in the lapse of a short period of time. Why use salol? Salol is antiseptic, and in connection with zinc oxid aids in establishing an increased degree of crystallization in the mass when in position in the pulp chamber of a tooth. Some time since I was reading an article wherein was stated the experience and claims of expert nurses, viz, that salol, when employed as a dusting powder on flesh wounds discharging pus the pus would decompose the salol into salicylic and carbolic acids. The thought occurred in my mind that salicylic and carbolic acids are both antiseptic in their action, consequently I decided to engage in some experiments in the use of that drug in combination with other agents in filling the roots of pulpless teeth. My experience in the use of said drug in the relationships in which I have used it, is not a full assurance of invariable future success in its use; but the cases wherein I have made use of it during the past four months, give me promise of success up to present date.

A Suggestion About Cocain.*

BY G. E. HUNT, D.D.S., INDIANAPOLIS.

A SURVEY of the situation leads me to think that the per cent. solution is largely responsible for the various ill effects observed. The great majority of dentists, I believe, get their two, three or

*Abstract of paper read at American Dental Association, Aug., 1895.

four per cent. solutions put up by a druggist and their ideas of how many grains of cocain are required to make a four per cent. solution are often hazy. . . .

In the majority of cases an eighth or a quarter of a grain will accomplish the desired result, while the maximum dose, one-half grain, would be attended with at least temporary ill effects. I would suggest that the per cent. solution be entirely ignored in using cocain *per se* and that the intended dose be dissolved in an indefinite, convenient quantity of water and the entire amount exhibited. . . .

Following this plan of procedure will impress *dosage* on the operator in a manner that no other method can succeed in doing. Another, and a potent argument in favor of this mode, is the fact that every solution used is a fresh one. The rapid deterioration of cocain solutions renders the degree of effects produced from twenty-four or forty-eight hour solutions extremely problematical. By dissolving the cocain as it is needed, and only a short time is necessary to accomplish this, the full effects of the drug are assured.

In order to use cocain in this way it becomes necessary to have a pair of balances for the accurate measurement of the drug. These balances will, however, be found useful in various ways and should be part of the equipment of every well-conducted dental office, whether cocain is used or not.

A Rare Case.*

BY H. L. AMBLER, M.D., D.D.S., CLEVELAND, O.

A YOUNG man, aged 17 years, has both superior lateral incisors missing and no outward signs of their being imbedded in the jaw.

The inferior denture has the proper number of teeth, but both of the central incisors are remarkably small, perhaps one-fourth the size they should be; still they are of good form and structure, firmly fixed in the alveolus, and the gingiva indicates well formed roots, about in proportion to the crowns. The young man's

* Abstract of paper read at the American Dental Association, Aug., 1895.

father, mother, and grand-mother, who are very intelligent people, and have a dentist in the family, state that they are positive that the temporary central incisors were shed, and that these two small teeth erupted in their places.

Both superior and inferior temporary dentures were normal. His mother needs a left superior lateral incisor to complete a full denture; the father's is complete. The grand-father and grand-mother, on both the father's and mother's side, had the full number of teeth. The only abnormality we could trace, except the mother's, was that the grand-mother retained the left superior temporary cuspid until she was fifty-three years of age, at which time a permanent cuspid, of fair form and size, erupted and is still in place after a lapse of twenty-three years.

The Education of Our Patients.*

BY V. H. DIFENDERFER, D.D.S., NEW CASTLE, PA.

UNFORTUNATELY the channel for the education of the masses is very narrow, and as a consequence a large majority of patients when first coming to us are comparatively ignorant of anything pertaining to the oral cavity. Indeed, a great many persons of refinement exhibit gross ignorance of oral hygiene and are frequently the most glaring examples. How often are we stricken with a feeling of awe, when called upon to look into a mouth in which the ravages of decay have completed destruction, especially when it is the mouth of a child perhaps not over eight or ten years old, with several of the sixth year molars completely ruined by decay, and the child suffering intense pain. Are the parents alone to be censured for allowing their children's teeth to go to destruction? Surely you will not say yes, for when or where did they ever receive any education or instruction on the care and preservation of their teeth, unless they have had the good fortune to be brought in contact with some dentist who has been kind enough to share part of his knowledge.

Again, there is but little in the way of current literature on this subject, consequently the public possess but very little inform-

* Abstract of a paper read before the joint meeting of the Lake Erie Dental and Pittsburgh Odontographic Societies, 1895.

ation, only such as they have acquired by force of circumstances. Nine out of ten cannot tell you the number of teeth in the deciduous set; possibly a few more have learned the number in the permanent set; a large proportion may think the sixth year molar a tooth to be shed, they fail to see why it is a permanent tooth when no other has been shed in the place it occupies, and an almost equally large percentage think that when the nerve, as they term the pulp, has been "killed" that the tooth can never ache again. Children receive but a very limited amount of education in this direction in our public schools, and as a result they grow up absolutely ignorant of anything but the mere fact that they possess teeth, until such time as suffering causes them to be brought to us for relief. To my mind these facts conclusively demonstrate that a most deplorable state of ignorance exists, and who is responsible for such a state of affairs if it is not the dental profession! Do we realize our responsibility as being the authority on this subject, when we allow dental education to remain one of the most obscure subjects in the current literature of this age? The foregoing facts go to show that the most successful way to correct the present existing state of ignorance would be to properly educate our children on the hygiene of the mouth, and the care of its appendages. I believe that this end can best be attained by introducing into the text-books of our public schools (in connection with that of physiology) well written chapters on certain of the fundamental principles of dentistry, viz, the period of eruption of the deciduous and permanent teeth, their condition in health and disease, the methods of their protection. Bringing into prominence the mouth as a source of infection, and the loss of the teeth as being the cause of disordered digestion, etc. The result of such instruction will be to demonstrate that a clean mouth and good teeth are essential to good health. Thus the idea once imparted in the child will be productive of the most happy results, not only as to the individual himself, but by reason of the knowledge that will be handed down to the coming generation, where it would doubtless prove the greatest blessing.

What the public need is the simplest kind of instruction on all that pertains to the teeth. They should be taught that decay of the teeth is a disease, and needs the intelligent treatment of a skillful dentist just as surely as does the disease of any other

organ of the body need the care and skill of an intelligent physician.

Whilst we are not all educators, nor possess the faculty of imparting knowledge to one another, yet we can oftentimes instruct our patients by a very few impressive words, in such a way that they will readily grasp the idea, and be very grateful for the advice.

Inexperienced patients coming to us are usually timid, and do not care to question us about the little matters pertaining to the mouth. Then, again, they may be ignorant of what is wanting or should be done. How well do I remember the first dentist I had occasion to call upon for service, and the cool indifferent treatment I received at his hands. Not a question was asked; nothing told me of the condition of my mouth, or did my teeth need more careful attention in the way of brushing, and what should I use in the way of powder, if any. I was desirous of knowing all about these little matters, but I was afraid to ask lest I might offend the dentist, consequently I came away knowing little more than when I went there, and I have to this day maintained the impression that that dentist did not know his duty. If he did, I attribute his motive to either negligence or selfishness. And to reiterate, I would say that when a patient comes to you and places his or her case in your charge, I am of the conviction that it is your duty to so instruct and advise him that he may be the better prepared to avoid unnecessary and painful suffering.

We should not forget that the noblest mission of man to humanity is the alleviation of suffering, and we can accomplish this end by educating our patients, as well as by restoring lost or diseased organs.

In conclusion, I would say, let us uphold as a motto for our profession—“*Altiora quaerimus.*” Let our aim be to elevate the standard of dentistry by improving the condition of our fellow-beings, for in so doing I believe we will exalt our standing as professional men before the world, and thus our art will prove a greater blessing to humanity.

Filling a Tooth with Amalgam.

BY W. M. JENNINGS, D.D.S., CLEVELAND, O.

For example I will use a second lower left molar tooth, with a posterior proximal cavity extending considerably under the gum and involving about two-thirds of the crown. Of course, from the size of the cavity, the nerve would be exposed, and having removed it and filled the roots properly I would proceed as follows:

Prepare the cavity, having the edges smooth and the inside slightly larger than the opening; then fill it about two-thirds full with a good cement and allow it to harden. After this trim the edges of the cavity, so that no cement adheres to them, and also trim the cement inside just enough to leave a sufficient undercut and space to allow contouring of filling. Now select a screw matrix of suitable size for tooth (German silver or steel are the best, as they do not amalgamate) and put around the tooth, crowding down under the gum sufficient to go below the edge of the cavity, but before tightening put another piece of German silver between the tooth and band matrix, also below the edge of the cavity; now tighten the band. Before putting in the filling take an excavator and trim the borders of the cavity and remove all roughness of edge next to matrix, if any has been caused by putting it on; we are now ready for the filling. Mix the amalgam very dry, having it resemble an almost dry powder, and carry it to the cavity with a small amalgam spoon; press a small quantity into the cavity with a plastic plugger of the proper size; now with engine use a small size (smooth, round) burnisher and rotate it quite rapidly in cavity. Add more amalgam and use burnisher same as before, and do so until the cavity is full and the amalgam is quite hard; then with a larger burnisher rotate it rapidly over a piece of tinfoil placed on the filling. Trim the filling down and carefully remove first the screw matrix then the other one. Now trim the filling as near as possible to the original shape of the tooth, seeing that the articulation is right. Polish at another sitting. A filling put in in this manner is much better and more satisfactory than by simply using hand pressure and does not change position in crystallization as in the other way, as the tin takes up all excess of mercury, leaving the filling almost hard after it is inserted.

Electricity as a Therapeutic Agent.*

BY DR. G. L. SIMPSON, ALLEGHENY, PA.

WE will consider superficially electricity as a therapeutic agent, especially as applied to dentistry. I wish to repeat some statements made in former papers, but with some modifications and extensions, and those of you to whom the subject has become old, will kindly turn a deaf ear while I state that the galvanic current, if properly applied, is of invaluable service in allaying inflammation of the peridental membrane, and of alleviating pain arising from various disturbances found within the oral cavity.

It is quite possible in from 15 to 20 minutes to allay inflammation, and relieve the most excruciating pain, by the application of the positive pole to or over the affected part, and the negative pole to some remote part.

Almost all alveolar abscesses can be prevented by one, two, or three applications of 15 or 20 minutes each.

Galvanic electricity acts by equalizing the circulation. The positive pole of the tension, or galvanic battery produces an electro-tonic effect, and stimulates capillary circulation.

It is valuable in allaying the pain arising from severe cases of Riggs' disease.

The first consideration is the nature of the current desired. If it is to be the galvanic, then a current of high voltage is wanted, say from twelve to thirty should be at your command, and a current of from one to five milliamperes.

To obtain this, from ten to thirty cells would be required and should be connected in series; that is, the zinc of one cell to the carbon of the next and so on.

To intelligently use electricity, either for its electro-tonic effect, or cataphoric, a milliamper meter is indispensable, and to assume to know what you are doing by counting on so many volts, and so much current, by the number of cells in the circuit, is absurd, as there is no more uncertain quantity in the universe. "The wind bloweth where it listeth." So is it with this great force of nature; it is here and there, and the different resistance

*Abstract of a paper read at joint meeting of Lake Erie Dental and Pittsburg Odontographic Societies, 1895.

offered by different persons, and some tissues offer more resistance than others, all these cause us to grope in darkness, unless we have some definite means of knowing what we are doing. A good rheostat, or current controller, is almost a necessity. Another difficulty in the way, is a proper mouth electrode.

After making various contrivances, with indifferent success, I finally constructed a universal bipolar mouth electrode that will, I believe, meet all the requirements.

Any metal parts coming in contact with the mucous membrane should be made of gold or platinum; any baser metal will often produce a very painful sore. As platinum is a very poor conductor of electricity, I made the contact parts of gold, but this should be covered with wet cotton or lintine. After an electrode has thus been prepared and connected with the wire leading to the zinc of the battery, it should be placed so as to send the current through the inflamed tissues, then the negative electrode, or cathode, should be applied, preferably to the hand of the patient on the affected side. For when applied to the face or neck, as formerly recommended, it makes an objectionable temporary red spot, if not a small blister. If applied to the hand there will be need of more current, as the hand offers powerful resistance to the current, and especially the heavy epidermis of the hand. When the electrodes have been thus applied, turn on the current gradually until the milliamper meter shows one, two, or three milliamperes. According to the susceptibility of the patient, it is seldom necessary to use more than three milliamperes, unless for a very few seconds, and then, perhaps, four or five at the most. Some patients complain of a tired feeling even with a very mild current; it is best then to give them a rest, or still more, reduce the current. I have had two or three patients that have become faint, and had to discontinue the treatment, at least for some hours.

For the complete control of inflammation of the peridental membrane or abort an alveolar abscess, or kindred troubles, I have seldom found it necessary to resort to cataphoresis, or the introduction of drugs through the mucous membrane by the use of electricity, but the use of aconite or even iodine may sometimes be employed with happy results in this way.

A weak solution of cocaine may be thus used for minor operations, very successfully, but I would advise some care in dealing

with two such powerful weapons. For the relief of severe facial neuralgia, I will quote from an article by Fredric Peterson, M.D., in Biglow's International System of Electro-Therapeutics:

"With an additional experience of twelve years in the frequent treatment of neuralgias of superficial nerves with 10 to 20 per cent. solution of cocain on the anode, I can only reiterate my conviction that it is the best means we have for the relief of such conditions.

"Cocain employed in this way does not cure neuralgias of peripheral origin. All that is claimed for it is, that it gives relief *without* producing constitutional effects, and is, therefore, superior to any narcotic given internally, and to any other local application."

I can endorse these statements thoroughly in all but perhaps the last clause, as I believe there is one other local application that I consider superior to cataphoresis with the galvanic current, and that is the faradic or induced current.

With some experience with both currents, I do not hesitate to say, that the faradic has given me the most pleasing results in all purely neuralgic troubles. My experience with the faradic current, in the treatment of pericementitis, has not been with the same uniform good results. There is a stage where it can be employed with favorable results, but there is not room in this paper to consider it. A few common-place suggestions for every day use, and I will not tax your patience farther.

First, when about to discontinue treatment, do not pull off the positive electrode. If any one, let it be the negative, but better still, slowly reduce the current, "and *then* form a good habit of removing the negative electrode first, and thus prevent the possibility of a shock."

Then always bear in mind that the electrodes connected with the zinc element is the positive pole, and if you have any trouble in tracing the conducting wires to the battery, as there will be where the batteries are at a distance and many wires, *if you* get the wires confused and are uncertain, just make a solution of iodid of potash, place two wires in it, if one is positive and the other negative, decomposition will take place liberating the iodine and oxygen at the positive pole, and the alkali and hydrogen will go to the negative. In using the faradic current the less sensitive electrode is termed the positive.

I have but treated this subject superficially, as the short space allotted to one paper will not permit me to do otherwise.

The Office and Eccentricities of the Dental Pulp.*

BY D. D. SMITH, PHILADELPHIA, PA.

It is well known that the different formations which make up the body of the tooth receive life and nourishment from two distinct sources; from the pulp and from the pericementum of the root. The pulp is the central figure; the important factor of every tooth. To it is committed the care of the newly erupted tooth and its office work is to readjust, recalcify, consolidate, strengthen and sustain the enamel and dentine.

As a rule the earlier a tooth is developed the more readily it yields to decay, and the more time taken for calcification before eruption, the greater the resistance to decay manifested on the part of the tooth. . . .

The law of *use* governing tooth consolidation, widely known and rigidly observed among patients, would probably do more to arrest the extensive decay now prevalent, between eight and fifteen years of age, than dentistry can ever accomplish by mechanical methods.

Too much importance has been and is attached to inheritance as determining the character of the teeth. Standing in advance of inheritance, for children, is *use* of the teeth in mastication. An effort should be made to save the sixth-year molar. Devitalization of the pulp carries with it a more or less rapid retrogressive change in the quality of tooth material, and that without power to arrest it. Fillings may prolong the existence of the tooth, as such, but with the arrest of vitality in the pulp there is cessation of all vital sustaining action, which hitherto assisted in its preservation, and not only so, the imperfectly calcified enamel and dentine already built into the tooth, is now in contact with devitalized connective tissue, which, in the imperfectly consolidated tooth, becomes itself probably a source of disintegration, and assists in its destruction. What has been said of the sixth-year molar may also be said of all other of the young permanent teeth. Later in life we find teeth which have been decay resisting for fifty or sixty years, seemingly changing in structure, assuming apparently a state of partial decalcifica-

* Abstract of paper read at American Dental Society, Aug., 1895.

tion, returning again to the conditions of childhood, as evidenced by their yielding more readily to decay.

The teeth have softened and if refilled with gold, in a comparatively short time they begin to darken around the fillings. . . .

Now, what has brought about this change? Is it not the pulp after a period of practical inactivity again at work but now transforming the compact material, which it placed in the tooth, into a condition wherein it yields much more readily to decay. . . .

As the tooth is when the pulp is destroyed, so it must remain except as to those changes which take place through the gradual disintegration of the internal structure of all pulpless teeth. . . .

Pyorrhea alveolaris is seldom or never found in connection with young teeth; it seems to be emphatically a disease of adult life; generally middle life. It is never found in connection with devitalized teeth, where devitalization preceded the manifestation of the disease.

A National Dental Library and Museum.*

BY W. DONNALLY, WASHINGTON, D. C.

"THERE are now 150 public museums in the United Kingdom, all active and useful. While museums in their too rather vague divisions of science and art attempt to cover the whole field of human thought and interest, there is an increasing tendency to specialization, and from this we may expect a nearer approach to perfect work and a more direct influence upon the separate departments of human activity."

The writer then cited the advantages of the Army and Medical Museum and Library at Washington, as the proper place for the institution of a national museum and library. It is stated that the Medical Library, in March, 1895, contained 114,567 bound volumes and 183,778 pamphlets. The library contains three-fourths of the medical literature of the past ten years. There are about 53,000 visitors to the museum and library annually, besides the library is used by over 3,000 students annually.

* Abstract of paper read at American Dental Society, Aug., 1895.

After citing the advantages of this institution, he said: "Never was there such an opportunity freely offered a profession to safely* and certainly perpetuate the fame and effect of its achievements, to give it a higher place among the learned callings, to acquaint the profession and the general public with its acquirements, and to secure to it a depository of all things of present or future historical and educational value—a depository already famed as the richest in medical lore and further enhanced by its unequalled index-catalogue. You are urged to consider the invitation of Dr. Billings, to formally adopt this government museum and library as your own National Dental Museum and Library."

The Pathology of Inflammation.*

BY GEORGE EDWIN HUNT, INDIANAPOLIS.

For purposes of description the process of inflammation may be divided into first, changes in the bloodvessels and circulation; second, exudation of fluid and of blood corpuscles from the vessels; third, changes in the inflamed tissues. This division is made merely to facilitate consideration of the subject, and it must not be imagined that these changes occur successively for such is not the case—they are all taking place at the same time.

We have first dilatation of the vessels in the affected area, with increased rapidity of blood flow.

Irritation of a sensory nerve will produce dilation of the arterioles in the area to which the nerve is distributed, by reflex action. On account of their non-elastic walls the capillaries connecting with these arterioles do not dilate proportionally; consequently blood pressure in them is increased and acceleration of blood flow through them results.

After about an hour of this accelerated blood flow that of retardation of blood flow occurs, the vessels continuing dilated. Retardation is due to certain changes in the inner or endothelial wall of the smaller veins, which cause it to become sticky. This degenerative change also affects the cement substance binding together the edges of the endothelial cells consti-

* Abstract of paper read at Tri-State Dental Society Meeting, Detroit, June, 1895.

tuting the vessel wall, deteriorating it and rendering it more penetrable.

The increased friction produced by this sticky condition of the vessel wall is soon evidenced by the gradual slowing of the blood current, and the tendency of the leucocytes to adhere as they roll and tumble along the periphery of the lumen. It is probable that this morbid condition embraces also the inner wall of the arterioles, inasmuch as it is histologically identical with the corresponding wall in the veins, but the adhesion of leucocytes is greater in the veins than in the arteries, because the blood is not driven in successive waves in the former and the flow is not so intermittingly swift. The valves in the veins also assist in causing arrest of the leucocytes.

Other corpuscles adhere to these, and the lumen of the vein is gradually occluded—the blood current becoming proportionally slower. This process extends back into the capillaries also.

As long as there is a channel of sufficient caliber in the veins, the red corpuscles pass on through, but when that is closed to them, or so nearly so that only a few may find a way, the others mass themselves in the capillaries and arterioles, causing these latter vessels to look as though filled with a red injection mass. There are leucocytes mixed in with the red corpuscles, about the usual proportion as found in the normal blood.

Oscillation occurs when the veins have become so nearly occluded that the flow is materially arrested. Then, at each heart impulse, the blood surges into the arterioles and capillaries leading to the affected veins, and, not being able to pass through, flows back during diastole.

Stasis follows oscillation. In stasis the blood mass is stationary in the vessels, although it may remain fluid for two or three days. During stasis the capillary wall, being unnourished, gradually perishes—starves to death. When this occurs thrombosis or coagulation of the blood takes place.

This, in brief, constitutes the changes occurring in the blood and circulation.

Coincident with dilatation and increased blood flow, we find the normal exudation of fluid from the vessels much increased in quantity and changed in quality—becoming much more albuminous and consequently more coagulable. At first the lymphatics, by extra efforts, are able to remove it, but in a short time it is

poured out in such quantities that those vessels are overtaxed and the fluid accumulates in the connective tissue spaces, swelling the part.

Now, if a small vein or capillary is closely observed, leucocytes are seen passing through the vessel wall, at first scatteringly, but eventually in great numbers. They pass out through small openings in the cement substance which joins together the edges of the endothelial plates constituting the vessel wall. During inflammation, while the vessels are distended, this cement substance gives way in the shape of minute holes or stigmata, which gradually become larger and are known as stomata.

The leucocytes pass through the stomata mainly by virtue of their amoeboid movements. The cause of this diapedesis of leucocytes may be found primarily in the deteriorated condition of the vessel wall, by which facilities are afforded for its penetration, and in the inherent tendency of the cell to exert its power of amoeboid motion. Contributory conditions exist in the pressure of fluid and other leucocytes from within and the probable fact that the surface of the endothelial plates are sticky and the cement substance, through which the cells pass, is not, so that passage through the stoma is easier than passage along the inner surface of the wall over the sticky endothelial plates.

The red corpuscles not being endowed with amoeboid motion, are not found in any quantity outside of the vessel, unless death or rupture of the vessel wall occurs; then an immense dispepsia of red corpuscles may occur from the engorged vessels. A few red corpuscles are seen in the earlier stages, but they are those that some unwonted circumstance has thrown in front of a large stoma, and which the blood current has forced through.

The white and red corpuscles thus set free in the tissues, are washed along by escaping fluid, and crowded forward by other leucocytes escaping, and finally may wander some distance from the vessel from which they escaped. The leucocytes also move away by their power of amoeboid motion. Thrombosis, when it occurs, puts an end to the escape of fluid and of corpuscles.

The changes occurring in the inflamed tissue may be briefly described. The tissue is softer than natural, usually watery looking, blurred, and the cells indistinguishable. The cells are separated by fluid and obscured by fibrin filaments and leucocytes. Nourishment ceases and coagulation necrosis may occur.

Such, in brief, is the course of all inflammations. If the cause of the irritation is removed and the general health is fair, an inflammation may be stopped at any stage. If coagulation takes place, an abscess with loss of tissue is bound to result.

Rise of temperature, where it does occur, is due simply to more rapid circulation of the arterial blood.

Swelling is due to the exudation of fluids and corpuscles into the part; pain, to pressure of such exudate on the terminal nerve endings, mainly. Impaired function is the result of the general injury to the tissues.

(To be continued.)

The Esthetic Correction of Facial Contours in the Practice of Dental Orthopedia.

DISCUSSION.

WE here present the gist of the remarks made in the discussion of Dr. Case's paper, read at the Tri-State meeting, and published in full in the OHIO DENTAL JOURNAL for November:

Dr. G. H. Cushing: I think the paper shows conclusively that, as Dr. Farrar remarked, "this demonstrates an era of advance in orthopedic surgery." I think we are most indebted to Dr. Case for an intelligent study of the mechanical principles which govern the movements of the teeth by applied force, in connection with the fact which he has demonstrated, of the possibility of moving the teeth and the processes together. You have seen what he has accomplished, and these models and drawings speak more eloquently than any language can express.

Two of these cases I have seen under treatment from the first. I cannot begin to tell you the extent of the improvement in the facial expression of No. 4. The maxillary bone and the process were so receded that there were depressions each side of the median line so deep that you could lay your finger in them. Those are now very nearly two-thirds obliterated, and though this mask shows a wonderful improvement, it does not show fully the great change which has been effected. I think he hopes in time to entirely obliterate the deep depressions under the alæ of the nose. From my observation, so far as the case has progressed, I have no doubt that he will succeed.

In case No. 9, the casts do not begin to show the improvement that has taken place in the short time in which the patient has been under treatment. The boy had the habit of dropping his mouth open continually. He does not do this at all now. I do not know why the movement of these teeth and the contouring of the face by this application of force should have produced that change, but it is a fact that it has. He is now a pretty respectable looking boy, and he was very far from that when he first went into Dr. Case's hands.

Dr. J. G. Reid: I suppose a few of you will go home imbued with the idea of being able to accomplish what has been shown here to-night by Dr. Case—who is master of the situation; attained only by years of experience and a close study of the physical forces employed and their application, how to direct those forces to the moving of teeth bodily in their sockets. Dr. Case will sit down and figure out on paper, by geometrical and mathematical processes, the direction and magnitude of force at the different points of a regulating appliance and the probable influence it will exactly exert. When you understand that, you will appreciate the success of which he has shown you evidence by these models. It looks easy, when you hear him explain it, but if you attempt it you will be deceived, if you suppose it to be easy. I have seen many of these cases from time to time every few days. Possibly you may feel inclined to doubt some of the results, but these models do not begin to show you the improvement, and in order to appreciate it you should see the individuals themselves.

Dr. L. Ottofy: The apparatus which Dr. Case employs seems complicated, but is simple when understood. However, that matters little. The point which I wish specially to mention is, that the patients wear these appliances without any apparent annoyance, with far more comfort than appliances made earlier and which were supposed to be very simple.

I would suggest to the essayist that, in connection with the preparation of his models and casts of faces, he also take actual measurements both of the expansion and retraction of the jaws, and of the faces themselves, so that we may have for future reference some absolutely tangible and indestructible evidence of what progress has been made in this line.

Dr. W. H. Jackson: As to the moving forward of the pro-

cess, I have in my own practice produced the same results, not in exactly the same way, but effectually, even where the intermaxillary process developed out of place, so that it left both cuspids standing out prominently and the incisors setting back even with the first bicuspid. The whole process, with those four teeth, was moved forward as a body, so that they came out even with the cuspids. There was a depression of the upper lip. It took between ten and eleven months to move them forward, without doing it so fast as to cause absorption, as Dr. Case has said. If you move them too rapidly, you may cause absorption in almost any case; and if you apply too great force, you may even cause a separation of the process between the teeth and crowd the front bony plate forward.

Dr. J. Taft: Sometimes in the regulation of teeth difficulty will occur because of irritation or inflammation arising. I presume, however, that the process is not pushed by Dr. Case to the extent of inducing irritation. I should like to ask him, has he found that there is a disposition to inflammation in the tissues, and does he not find it necessary sometimes to regulate the movements and the adjustment of appliances because of that predisposition?

Dr. Case: Yes.

Dr. Taft: Is it ever the case that special diseased conditions arise in the ordinary performance of this work?

Dr. Case: I have never had any experience in that direction.

Dr. Taft: I presume your work has been so well regulated that results of that kind have not occurred. I know that oftentimes in the regulation of teeth, when the pressure is too great and the movement too rapid, inflammation is set up, and I have known cases of teeth being devitalized, the pulps destroyed in that way. Here the whole tooth is moved bodily, and in its vertical position, right along from one position to another, carrying with it the outer plate of the alveolus, the inner plate of the alveolus either following or the space being filled up,—the space that is made by the movement of the tooth. If that process was pushed very rapidly, I can conceive that in some cases there might be irritation. Then, again, here are the vessels, the tissues entering the end of the root. That moves, and the question occurs, may not that sometimes be affected by this movement?

You have moved the tooth say a quarter of an inch, moved the foramen a line or two from the original position, and all that must be carried along with it, and the tissues must be distended, to accommodate this movement. I suppose that is the case where they are carried along in that manner.

Dr. Case: Not exactly that. If the entire bone is bent forward with the end of the root, then the point of the root is not carried through the bone, and the foramen that comes down, carrying the vessels to the tooth, is also carried forward, is not left in its original position. That occurs only in those instances where the movement occurs by absorption of the socket; and wherever that occurs, as I said before, the movement is always very slow; and I do not think I have moved the roots of a tooth—unless in one case—over an eighth of an inch. But where the entire bone can be bent forward, then the movement is always very rapid and quite extensive. Then the entire vessels and the bone itself seemed to be carried along together, and that also is a reason for not expecting so much inflammation as you speak of. And one of the great reasons why inflammation does not occur is, that the method of attaching the appliances and the method of applying the force holds these teeth firmly in their grasp. The force usually applied by those who regulate the teeth is a screw-force, which carries the tooth forward, and the next twenty-four hours it is carried a little farther forward. I used to have the same terrible condition of inflammation you speak of, when I used the old methods, the pressure and ligatures and rubber bands but now I do not experience that trouble so often.

Dr. Taft: I can readily see that you have a grasp upon the whole tooth, and it is carried along so that the force is distributed throughout the parts.

Dr. Case: Yes.

Dr. Taft: The whole moves along together.

Dr. Case: Yes.

Dr. Taft: And the vessels, and the tissue attached to the body of the tooth, accommodate themselves to the movement of the tooth.

Dr. J. G. Templeton: I should like to hear from Dr. Case in reference to the use of retaining appliances, and what he thinks is necessary in this line.

Dr. Case: Retaining the teeth in the position to which you

bring them is quite as important as the regulation of them, and is, I have sometimes thought, the most difficult part of the whole operation. I wish I had time to describe some of the new appliances for retaining teeth which I have recently thought out. Patients object very much to wearing appliances that show in the mouth. They want to get rid of the whole thing as soon as possible, and I have invented some new things that hold the teeth perfectly in place and yet do not show any more than a gold filling between the teeth. At some future time I shall fully describe them so that you will all understand.

Dr. Garrett Newkirk: I wish to call attention to the principle of the appliance for which, it seems to me, Dr. Case is entitled to the exclusive credit. The advisability of moving the end of the root has been understood for a long time, but just how to construct an appliance which would accomplish that result, and give the operator perfect control of the whole matter of the movement of the teeth, is something which no one has been able to accomplish satisfactorily heretofore. But Dr. Case has certainly solved the problem through a recognition of the mechanical principles involved.

Now, a word as to the production of inflammation. With this kind of an appliance the danger is reduced to a minimum, because the tooth is held firmly. There is no action and reaction. There is no uncertainty of movement. On a No. 18 wire there are about ninety threads to the inch, I think, so that you know absolutely, if you give the nut one revolution, that you have a forward motion of one-ninetieth of an inch. In almost any case you can control the amount of force, so that there is no possible danger of exciting inflammation. There is no more comparison between this sort of an appliance and our old regulating devices than there is between a nice watch and the old-fashioned threshing-machine. This is scientific, delicate, and positive.

Dr. N. S. Hoff: As I looked at these drawings and as the discussion was going on, the question came to me, "How is all this beautiful development of the face accomplished?" As I understand from the paper, it is not accomplished by moving the tooth through the alveolar process, but by moving the bones themselves; and if it is accomplished in that way, what bones are moved? You cannot move the bones of the face around without leaving spaces, and the question arises, what fills the

spaces, and where is this separation made? It occurred to me that, possibly, the cuspids were moved but little; and that this movement—especially where the process and the contour were developed—came about from the separation of the intermaxillary bone from the maxillary. Bow how can that be? The intermaxillary bone is united to the maxillary bone at a very early age, before the permanent teeth are developed, and the doctor states that many of these cases are fifteen, sixteen, or seventeen years old, and some older. At that period the intermaxillary and maxillary bones are certainly united, so that there must be a fracture or stretching of this union of the maxillary and intermaxillary bones between the lateral incisors and cuspids. The casts and models clearly indicate that it is the intermaxillary bones that are moved forward. I think if that is the case, if that is what is done, it will explain largely the way in which the force should be applied to develop this contour. The forcing out of the intermaxillary bones bodily would account for the lack of irritation and injurious effects to the blood-vessels and nerves, because we know that the blood and nerve-supply of the cuspids is different from that of the incisors or the bicuspids. It seemed to me that this moving-out process is one comparatively easy to explain, on the theory of fracturing or separating the bones along this original developmental fissure. How can we explain the contrary process—the forcing back of the bone? There could be no fracture of the bones in that way. In that case you must certainly move the teeth. I cannot see that anything could be accomplished in condensing the bone, but that you must certainly in that case move the teeth into the bone, or, by the continued pressure, produce absorption of the entire bone-matrix or condensation of its cells. Certainly, by making continued pressure upon the teeth in this direction, you do not produce displacement sufficient to accomplish what you evidently have done. Have you any explanation as to what change takes place in the bones structurally or anatomically?

Dr. Case: It is certainly very gratifying to me to hear so much said in praise of that which I have been able to accomplish, and it is especially pleasant to receive in this public manner the indorsement of my efforts, and the verification of the truthfulness of these models which I have presented for your inspection, from men who are well known in the profession, and who have been

intimately connected with a number of the cases I have treated.

The suggestions made by Dr. Hoff in relation to the exact movement that really takes place, is something that it is impossible for me to answer. In the proceedings of the World's Columbian Congress, I mentioned the relation of the intermaxillary bone and its development, and, without giving any special opinion myself, I said that it was possible that that had something to do with the case with which the four anterior teeth could be moved forward and, possibly, back. The subject of the movement of the roots of the teeth, even in a lateral direction, is one upon which there has been, for years, a great difference of belief among leading specialists in this department of dentistry; while the forward or backward movement of the roots of the anterior teeth with the entire bone in which they are embedded is a subject so new and of such a radical advancement over former accomplishments in this line, it is not strange that the profession are surprised and slow to accept or practice it.

ALL SORTS.

A Good Antiseptic.

In the surgical operating room of the Buffalo General Hospital, common ground mustard is now used in preparing the hands for operations, and in sterilizing the surface preparatory to incisions. It is an excellent disinfectant and deodorant, and it is by far the most effective of the vegetable antiseptics.—*Dental Practitioner and Advertiser*.

Good Work.

Seek to establish your business on good work, rather than on low prices; on downright honorable dealing, rather than trickery; on a steady, gradual, healthy growth of skill, industry and normal development, rather than any temporary, questionable or fortuitous circumstances. The first will carry you up with your business, and your business up with you—slowly, but surely; laboriously, but pleasantly; unostentatiously, but permanently. The other is fictitious, precarious, unreliable. The first is building your house on a rock; the other, on the sand.--*Items*.

A Method of Anchoring Large Contour Fillings in Incisors.

From a paper on this subject, presented at the First District Society of Illinois, by Dr. C. N. Johnson, and published in the *Dental Review*, we abstract as follows: "By contour fillings we mean cases where the proximate surface is so involved that the occlusal corner is gone, requiring a reproduction in filling material. Given a case where the pulp is dead and the anchorage is usually easily obtained, but where the corner is gone without much penetration of the decay toward the pulp the result is a shallow cavity which seems to tax the average operator in his attempt to gain sufficient anchorage. . . .

Possibly a clearer idea of the method to be described may be gained by taking a typical cavity and outlining its preparation than by speaking in a general way of the process. Let us suppose we have a large mesial cavity on a left upper central incisor. There is little penetration of the decay toward the pulp, but the entire mesioocclusal angle of the tooth is gone. This form of cavity apparently presents greater difficulties to the average operator than where the decay has penetrated deeper. In the present method of preparation the cervical half of the cavity is shaped in the usual way, being liberally extended cervico-labially and cervico-lingually. To obtain anchorage at the occlusal portion of the filling, instead of drilling into the axial wall in the ordinary manner a groove is cut along the occlusal surface leading from the cavity distally to near the distoocclusal angle. This groove must be made sufficiently wide and deep to admit of a large enough mass of gold being packed into it to insure strength, and in order to accomplish this in teeth with thin occlusal surfaces it is often necessary to cut away the lingual plate of enamel somewhat freely. This may be done with safety provided the enamel margins are properly beveled and gold built over them in the insertion of the filling. The distal end of the groove may be deepened somewhat to assist in retention. The philosophy of this form of anchorage consists in two things: First, it will prevent absolutely the tipping of the filling previously alluded to, and second, it increases materially the seating capacity of the filling. Since the appearance of Dr. Black's articles on the compressibility of filling materials and kindred studies, the seating area of our cavities becomes a matter of much importance, and it seems quite conclusively proved that, other things being equal, the larger the area upon which the filling rests to sustain it in the force of mastication the greater security it has against dislodgment. With the form of anchorage just outlined it becomes impossible for a filling to get out of a cavity short of a breakage, and if the mass of gold is made thick enough it will not break. It is readily seen that the greater the force brought to bear upon

the filling in the closure of the teeth, the firmer it is driven into the cavity, and if there should be any compressibility of the filling material the tendency would be toward a closer adaptation to the cavity walls instead of a lifting away, as in the ordinary method of anchorage.

At first glance there might appear to be several objections to this method. Some operators may feel a hesitancy about drilling into sound tissue in this way for anchorage, but it must be remembered that in the preparation of any cavity sound tissue is often sacrificed for this purpose. In this instance I am convinced that it is sacrificed to good account, and I feel sure that when the operation has once been done in this manner the operator will to a large degree find his hesitancy gone. There is a feeling of security when the gold has been built well over and anchored into the occlusal surface that does not obtain in any other kind of cavity formation for this class of fillings. Another objection might seem to rise in the apparently unprotected labial plate of enamel. The labial plate is always left standing for appearance even when the lingual plate must be cut away for strength, and if not properly protected might prove an element of weakness. But by carefully beveling the enamel margin and building gold over the bevel, it is so perfectly protected that in all my experience with this method I cannot recall a single instance where this wall has failed. The acute corner at the mesioocclusal angle should be rounded slightly, and the same corner on the lingual plate should be cut freely away so that the outline of the filling is a gentle curve from the proximate to the occlusal surface.

This form of filling provides an adequate protection for the end of the tooth, and does away with what is ordinarily a vulnerable point in most fillings of this class when constructed in the usual way, viz., the junction between gold and enamel at the occlusal surface. The slightest chipping away of the enamel at this point is often disastrous, and results in final destruction of the filling. Again, there is opportunity for deeper and firmer anchorage without danger of approaching the pulp than where an undercut is drilled into the axial wall. The cavity is rendered freer of access for the insertion of the filling, and while more gold is used, it is more readily inserted and is hidden from anterior view by the labial plate of enamel. A filling of this form therefore looks no more conspicuous in front than where the occlusal surface is left intact.

There are, of course, many cases of contour filling in incisors where this method is not applicable, such for instance as a pulpless tooth where the decay is deep, or where the dentine is badly involved and the lingual wall gone for some distance toward the neck. These are the cases, however, where anchorage in other ways is easily obtained, and every operator must discriminate carefully and decide for himself which method is

indicated in each case that presents. I have merely endeavored to point out a method which is applicable to a certain class of cases, and I confidently believe that if it is judiciously carried out it will prove a reliable means of anchoring fillings in a form of cavity which heretofore seems to have given the profession much trouble.

Compressed Air.

In a paper read before the Chicago Dental Society and published in the *Dental Review*, Dr. J. W. Wassall says:—

“Any means that will contribute to the shortening of dental operations confers a boon both upon the public and the profession. Compressed air at the chair has positive value as a time saver, and is, as well, a promoter of greater accuracy and efficiency in those procedures which make up the ordinary work of the day.

The profession has been surprisingly slow to appreciate the advantages of this mode of employing air. It is by no means a novelty, having been used in this country by Dr. H. C. Register, of Philadelphia; since 1878, and Dr. Bing, of Paris, antedates him by a number of years.

In operative dentistry its uses may be divided into two kinds: mechanical and therapeutic.

Under the head of mechanical uses we have 1, chip blower, 2, cavity drier, 3, root drier, (for setting crown), 4, canal revealer, 5, cavity revealer, 6, dentine dessiccator, etc.

Among its therapeutic uses are 1, obtunding dentine, 2, assisting penetration of sterilizing drugs, 3, treatment of abscesses, of pyorrhœa and as a hæmostatic.

It is so constant an aid in the above enumerated operations that I should be seriously crippled without it. But the paramount use for compressed air is in the preparation of carious cavity for filling. While it may have varied and valued offices in other operations within the mouth the need of an efficient chip blower is constant. A trial of compressed air as an aid in making fillings, which operation is after all the most important of the services we render as a profession, and the most exacting and laborious task we perform will prove it to be indispensable, one of those aids which, being ignorant of, is not missed, but its value once known, one cannot be content without. This powerful or gentle stream of air is a wonderful new instrument added to your armamentarium. An invisible tool revealing and opening up to your vision unsuspected defects, obscure conditions both normal and abnormal, facilitating operations and rendering results more perfect and lasting.”

Crown Work.

In a paper read before the First District Society of Illinois by Dr. Arthur G. Smith, and published in the *Dental Review*, he says:—

“When the superior first bicuspid, has been lost entirely, it is frequently replaced by putting a gold crown over the second bicuspid and attaching to it a gold or porcelain ‘dummy’ so as to fill up the gap. This operation is a good one in many respects, but with it the gold shows on the second bicuspid, and the bridge is fastened only at one end, which is always undesirable. To overcome these objections I have devised an operation which while it may not be entirely original with me, I believe is sufficiently uncommon and novel to warrant me in going somewhat into the details of its construction.

To begin with, an accurate impression is taken and the plaster cast carefully made in the usual way. A plain plate tooth to fit the case is then chosen, ground so as to make a perfect joint at the gum, and then backed with gold or platinum in the usual way.

Holes just large enough to admit a No. 19 gauge wire are now drilled in the canine and second bicuspid, and their proper placing is a matter that requires care and judgment.

In the bicuspid the hole should be placed as near the distal wall as possible, at the same time taking care to drill the hole straight and to avoid drilling through the side of the tooth near the cervix or wounding the pulp. This operation is described here as being performed on live teeth.

In the cuspid there is far more solid dentine, and the danger of doing damage is proportionately less. Here it is important to so place the hole that when it is subsequently filled by the wire it will avoid the occlusion of the inferior cuspid. Having placed the holes successfully, return to the bicuspid and cut a ditch in the bottom of the sulcus just a trifle wider and deeper than the No. 19 gauge wire alluded to.

Next comes the vital and most difficult part of the operation, and this consists in bending a piece of No. 19 gauge piano wire so that it will slide easily into both holes until it touches their bottoms, and at the same time lie closely at every point to the teeth and gums. The usual shape of this wire is that of the letter U at each end, with a straight piece in the center. The reason for having the wire lie close to the gums rather than straight across the opening is so that the pins of the porcelain tooth and the wire do not interfere and fall together, thus preventing the tooth from being placed in proper line, and making a single point of contact around which the solder will subsequently rally and ball up with the obstinacy usual to it in such cases. Holes drilled in the plaster cast to correspond as nearly as possible with those in the

teeth will aid in bending the wire, but the final fitting will invariably have to be done in the mouth.

The wire having been bent, it is placed in position in the teeth and the previously prepared tooth also placed in its proper position and the two firmly fastened together with sticky wax. Tooth and wire are now carefully removed together and invested. On boiling out the wax from the investment previous to soldering it will usually be found there is more or less space between the backing of the tooth and the surrounding wire. This should be invariably filled in with small gold scraps or bits of waste foil before commencing the heating for soldering.

The soldering of this case is simplicity itself owing to the fact that on three sides of the backing you have platinum wire which aids and at the same time confines the flow of solder.

This work is set in the teeth with creamy cement which is allowed to thoroughly harden. The exposed cement on the bicuspid is then cut away, retaining points made in the bicuspid around the wire and the whole built in gold.

I have done a number of such cases as this and many of them have been in very active service for more than a year, and the patients are always loud in their praises of the usefulness, firmness and perfect comfort of the work, while in point of appearance I am sure this operation leaves absolutely nothing to be desired."

Method of Root Filling.

Dr. S. A. Milton gives his method of root canal filling in the *Dental Review*, as follows:

"Where the antiseptical conditions are right I proceed at once to fill the canal. I have an instrument developed in the past five years of my own design, so constructed that I can use first hot air, and by a touch of a cut-off change to a medicated hot air, by causing heated air to pass through a medicating chamber. I use in this medicating chamber iodoform, campho-phenique, oil eucalyptol, oil cassia, or any desired medication. The medicaments are vaporized by the hot air from the heating cylinder of the instrument. Differing from all other instruments in its being hotter from six to fifteen minutes after the heating cylinder has been heated up than when cylinder is first put into place in the instrument.

I have used compressed air cylinder and air pump for this purpose, obtunding, blow-pipe, etc., etc., for the past five years. When everything is ready I fill canal by usual method, pumping chloro-percha in with

smooth Donaldson No. 5, or other smooth broach, using iodoform abundantly. I then mix oxyphosphate and introduce and knead into gutta-percha thoroughly, using sufficient pressure as it thickens to carry chloro-percha thoroughly to apical foramen. After cement hardens remove surplus, and proceed to fill."

Pyrozone Plus Magnesia for Green Stain.

In an editorial in the *Odontographic Journal*, Dr. J. E. Line says:—

"At a recent meeting of the Rochester Dental Society, Dr. Edington reported the mechanical removal of green stain of "deepest dye" from every tooth in the mouth of a young miss, and its utter failure to reappear after a period of several months. He accounts for this by the diligent use of milk of magnesia, which undoubtedly corrected the conditions that made the deposit of the pigment possible. This suggests what may be characterized as ideal treatment: The use of pyrozone to take off the stain, and milk of magnesia to keep it off."

Preparation of Adhesive Plates.

In speaking of the use of the Spyer adhesive plate, Dr. J. A. McGrail, gives his method, in the *Items*, as follows:—

"After the case is packed, a piece of muslin, such as comes between sheet rubber, having been washed to remove the starch, is laid in its wet condition on the rubber, covering the whole surface, and up to the edge of the flask; then the flask is loosely closed and put in boiling water and allowed to boil for ten minutes, after which it is placed under the screw press and gently screwed down till the two halves of the flask come together; then the flask is separated and the cloth removed by wetting it. The adhesive plate, properly trimmed and slightly warmed over a spirit lamp, is then laid on the rubber, tin-foil side up, and the flask is again closed and put in boiling water and allowed to boil for ten minutes, after which the bolts are placed in the flask and screwed down, the flask put in the vulcanizer and vulcanized one hour and thirty minutes at 300.°

After the case is vulcanized and finished it is placed in pure muriatic acid and allowed to remain in the acid for an hour or more, and afterward washed with soap and water. The muriatic acid eats all the tin from the adhesive plate, removes all unpleasant odor, and the acid does not affect the adhesive plate nor the rubber."

Obscure Dental Lesions.

In discussing this subject at the Kansas State Dental Society, Dr. J. D. Patterson cited the following interesting case occurring in his own practice. We copy the article from the *Western Dental Journal*.

"A central incisor, which I had filled seven years ago with cement. A little while ago it commenced being sore, and I saw that the pulp had died. Being busy with other matters, I could not attend to the patient, and sent him to another practitioner. After he had opened it up and got a discharge of pus, he said he thought it would be all right. I found the patient waiting for me when I got to the office the next morning. His face was then swollen twice its natural size. I looked in the mouth and found that already the pus had gathered in an enormous quantity. The lateral incisor adjoining, which was a live tooth, was also involved and extremely loose; so was the central and the teeth back to the bicuspid, as in the other case. Now, there had been in this case no instrument put up to the end of that root, and if there had been an instrument full of pathogenic bacteria put into that tooth it would not have made any difference, because it was full of pus, which came bulging out as soon as an opening was made. I evacuated the pus. I thought this time I would 'take the bull by the horns,' so I lanced the gums and took the pulp out of the lateral, so as to get better drainage, and found it perfectly alive; there was no odor to it at all, and it did not hurt him a particle. I could rap on this tooth, after the inflammation had run for one day, and there was no sensation at all; no tactile sense at all to it. These teeth were involved to such a deplorable extent that when the patient came in again in the afternoon the swelling was still greater. In three days the condition of those teeth was the same as in the other case, and in less than a week all the teeth were extracted to the second molar. This time the inflammation was more violent than in the other case, and the destruction of the process and tissue more rapid. With the strictest precautions in every way, shape and manner, it seemed nothing could be done. I called in his physician in the first flush of the trouble and told him that I wanted the patient put on mercury or iodid of potassium, and also a strong tonic, which he did, but which did not prevent the loss of the teeth. However, as soon as the teeth were taken out the trouble subsided considerably. Some inflammation remained. Within ten days after the inception of the trouble every tooth upon that side back to the wisdom tooth was taken out, and all the alveolar process, and at one point the antrum was left open so that I could put in my little finger. I did not take away all the bone at once; I took it away in two operations. In this case, as in the other, healing took place kindly and rapidly, and plates are now worn to correct deformity.

Now the question is, what produces this extraordinary sequence of troubles resulting in the loss of bone and teeth? Of course we would expect a dyscrasia, a constitutional taint of some kind; but in both these cases there was, so far as outward examination and consultation with physicians was concerned, no history of that kind. In the first place, the young lady had been under treatment; she had taken tonics by advice of her physician. They were both prominent physicians who attended these patients, and they did everything that could be done. From the history and from the experience with both of these cases, there was no constitutional taint. There was in both cases a sluggish vitality and perhaps a low grade of tissue all over the body, but still nothing which would explain the extreme rapidity of this inflammatory process. I explain the difficulty in this way: These teeth had been in a diseased condition; the pulp had died under the filling, in one case perhaps a year before the trouble, and in the other case perhaps one or two or three years. I filled the boy's tooth, as I said, some seven or eight years ago. If the pulp died from the irritation of the cement filling, it probably died within a year, and perhaps that dead pulp was in there for that time; in the other case, for a few months at least. My explanation is that the poisonous pathogenic matter from dead pulp had been all this time infiltrating through the apical end into the tissue in all that territory upon that side of the face, daily and hourly, it having no vent, you understand; never any abscess, any fistula; never any opening for drainage. This matter had been attacking one point and then going to another, as pus will do, until that whole territory around all of those teeth which were eventually involved, or many of them, was poisoned; it was full of pathogenic micro-organisms; not giving enough trouble to awaken any soreness or suspicion, but still poisoning that tissue, so that when additional irritation ensued from low health, or the nuclein or pus removers of the blood could not absorb or destroy that disease, the tissue was in a condition predisposing it to this trouble. You cannot expect those pulps to have remained there without this infiltration from the apical end through that tissue. You can see how it could readily occur; once getting into the tissue and poisoning the periosteum and the alveolar process, and placing them in a condition whereby, additional irritation being set up, the tissues at once fall a prey to the inflammatory action. In the treatment of such cases, the quicker heroic measures are adopted after necrosis threatens—and necrosis threatened in these cases within three days after the commencement of the trouble—the better it will be for the patient. It was a remarkably rapid production of vast quantities of pus, great spoonfuls forming within a short time, and you could take a probe and run it around and see there was no original bony

attachment left to the involved teeth within three or four days from the commencement of the trouble."

First Permanent Molars.

In an essay read before the Toronto Dental Society and published in the *Dominion Dental Journal*, Dr. N. Pearson treats at length this much discussed tooth. Among other things he says:

"Ordinarily the natural inception of the sixth year molar will be met by a growth of bone, a prolongation of the circle to meet the demand and, by the time of its full development, the jaw and the alveolus have been added to the original formation to just the extent required for this tooth, all tending to add to maturity, expression and facial development and symmetry. Here we have situated the largest tooth in the formation, central as regards mastication, first to get to work in grinding, almost invariably perfect antagonism, never irregular, and, in fact, the keystone of the whole arch, put there designedly, intended for work, and come to stay. Unfortunately it is not always perfect; sometimes very imperfect, often troublesome, generally weak, subject to infirmities so are children, always the object of solicitation, and a stumbling-block to the professional, amateur, and 'others.' I now add emphatically to the *saving* argument, that this tooth should never be removed for regulating purposes, except in rare and very exceptional cases, and never before the appearance of the twelfth-year molar. I am not speaking by the book, I am now speaking from close observation for many years particularly directed to this point. For years I directed my course by printed instructions from standard authority. I extracted sixth-year molars where there was reason to doubt a prolonged existence or a slight deflection in the anterior teeth. I don't do it any more. I never looked at the roots of a first molar without a sigh of regret, a tinge of shame, and a professional blush, and I don't do it any more—any more than I can't avoid. I bend my energies to avoiding it, and generally succeed. In the early days of my hallucination for extracting these teeth I made victims of my three eldest children, and can never forgive myself for it. I present you for inspection several models which speak for themselves; also, by contrast, you may compare other models before you with these teeth *in situ*. I need not comment on either.

These teeth are removed inconsiderately and indiscriminately—without consideration as to the effect upon the facial expression or use in mastication, and without discrimination as to porportion or malposition of other teeth."

Therapeutics of Green-Stain.

In a paper read at the New York State Dental Society and published in the *Dental Cosmos*, Dr. S. B. Palmer treats this subject under three heads:

"A. *Agents facilitating the removal of the stain* Probably the most practical and universal of the powders is fine pumice. A good wheel for flat surfaces is moose-hide. Rubber cups reach many difficult places, and are effective because they carry the powder much longer. Narrow polishing strips, with thin cloth backs, cut to a point at one end, passed between the teeth near the gums, charged with powder, are good for approximal surfaces. In cases of uneven surfaces of enamel, coarse pumice can be used to good advantage, as it will enter deeper into pits and depressions. Still, with all the above-named appliances, the stain cannot be readily removed from inaccessible surfaces. After experimenting with many agents, I have adopted pyrozone, three per cent., with which to moisten the powder, and, in extreme cases, add one or two drops of phosphoric acid, used for cement fillings, to a teaspoonful of moistened pumice. A tumbler of warm water, containing a little carbonate of soda, is good for rinsing the mouth. . . .

The removal of stains (green or other) mechanically involves or necessitates the loss of more or less of the tooth, robs the superficial portion of its fine structure and luster, and prepares the way for a speedy return of a deeper dye, with repetitions of the process of removal until the child has outgrown the conditions of which green-stain is simply an indication, and of no more consequence *in itself* than red stain or blue. To avoid this mechanical mutilation, which is urged chiefly because of the offensiveness of the stain to the eye, two, of what appear to be purely chemical processes, have been resorted to:

1. The application to the stained surface of iodine, followed by weak aqua ammonia (or aromatic spirits), repeating the applications at the same or a subsequent sitting until the stain disappears.

2. Removal of oily deposits from the teeth by the application on cotton of ammonia or bicarbonate of soda, followed by clear water, and this by twenty-five per cent. pyrozone, well rubbed in with cotton or a leather buff, followed in turn by soda, to neutralize the slight acidity and mitigate the occasionally caustic effects on the softer tissues. This latter treatment is effective to a remarkable degree, usually accomplishing its purpose promptly and always without injury to the teeth, either as to structure or luster, which we have demonstrated repeatedly as well out of the mouth by immersing teeth in caustic pyrozone for periods of two weeks at a time.

In case the enamel is roughened and dissolved nearly through to the dentine, a stone wheel, fine grit and broad face, will give a better surface by grinding the prominent portions down, which will lessen the depression. In the event of sensitiveness, it is better to make two or more operations, leaving the surface polished each time. To reach deep pits, the small brushes used with the engine do nice work; by cutting them back one-half the length and to a point, they are better than wooden points to hold the powder.

B. *Agents acting preventively.* The two most prominent conditions favoring green-stain are roughness of enamel and uncleanness, or neglect to remove that which ultimately produces it. After a case has been treated as above mentioned, with ordinary care in brushing, and the use of a dentifrice, there is seldom any recurrence. With the habit of neglect which allows the deposit, one lesson in prevention will not always be sufficient, although the patient may think the instructions have been followed. It is much like the removal of tartar; by care it can be prevented from any considerable lodgment; by neglect it accumulates. Usually, when a patient calls for a removal of the pigment, both density of the enamel and understanding how to prevent a recurrence are greatly in favor of success.

C. *The proportion of the recurrence of the stain.* The proportion of recurrence is determined by the attention given to instructions. With young children and no one to see that the teeth are cared for, we would look for a large percentage of recurrences. With proper care quite opposite results would follow. . . .

By close observation I am convinced that, with saliva ducts discharging freely under the lips, there would be little green-stain and still less erosion of enamel."

Crown and Bridge-Work.

Regarding this class of work, Dr. T. E. Weeks says, in the *Dental Review*:

"Dr. Bailey made a good point in saying that it isn't always necessary to remove all of the enamel to insure a perfect adaptation of band at the gingival margin. Teeth which are candidates for gold shell crowns usually have cavities on one or both of their proximate surfaces. Under these conditions it is very easy to so shape these surfaces that the tooth when viewed buccally or lingually presents a truncated cone. In most bicuspid and molars there is the greatest overhang of enamel on the lingual surface. If, then, the buccal surface is so shaped that it converges toward the center of the tooth, the enamel on the lingual surface need

be disturbed very little ; it becomes apparent that an overhang of one surface will not preclude a perfect adaptation of the band at the gingival line.

If our bands are made of twenty-two karat gold alloyed with pure silver, they can be sufficiently shrunk with a burnisher to overcome a slight overhang of enamel. My observation has convinced me that only a small portion of the irritation and inflammation of the soft tissues about teeth bearing crowns, is caused by bands which do not touch the tooth at every point of its circumference at the gingival margin. Such irritation comes from three causes. First, from the edge of the band being rough or improperly beveled. Second, from the band being forced so far beneath the free margin of the gum as to encroach upon the tissues at some point. Third, from lateral motion caused by the stress of mastication upon a crown which does not occlude properly in every position taken in mastication.

A fourth cause of irritation is imperfect contour and contact of the proximate surfaces. I do not wish to be understood as disparaging the necessity for the most careful preparation of teeth and roots which are to carry crowns, but to emphasize the fact that there are several other points of equal importance if we would avoid failures."

The Advisability of Bridge-Work.

In an article in the *Journal British Dental Association* Geo. Thompson cites the following case :

"I have here not a very good model of the upper jaw of a girl of 19. It is one of those cases where a bridge seems to be the ideal treatment; and it was my original intention to so treat the case. Every tooth seemed to be hopelessly carious ; there was not one with a crown remaining. I extracted all I deemed unworthy of salvation, which left in good condition two particularly strong canine roots, two good first molar roots, and one central incisor. Waiting for the absorption of the alveolus I made a temporary plate, crowned the molars, and fixed temporary Logan crowns upon the canines and central. When I inserted the whole the effect was horrible ; the fact was then revealed that, owing to the early decay of the molars, the bite had closed down, and the canines had been gradually protruded out of position. I reconsidered the case and added canines to the plate.

Eventually I made a gold case, with gum sections to fill in where absorption of the alveolus had taken place, and strong, broad bands around the capped molars.

The advantages of this method appear to me as follows, viz:—

- (1) The teeth which support partly, or rather steady, the case, cannot decay, and the slight daily strain put upon them is relieved by a nightly rest.
- (2) The comfort and cleanliness of the appliance.
- (3) Its permanency.
- (4) The facility with which it can be repaired in case of accident.
- (5) Its inexpensiveness.

In favor of a bridge in this case would be the comfort to the patient of being able to laugh, sing, and romp without a thought of her teeth, and the general feeling of confidence one has in a fixed appliance.

The roots, being strongly implanted, would bear a great strain; but on the other hand, where this is the case, the opposite jaw may be equally strong, and the force correspondingly great. It would be no use making a bridge in this case with flat teeth backed up in the usual way. It would be necessary to tip the teeth with gold, and have the porcelain as thick as possible; as the incisors would be unsightly tipped with gold, they would have to be kept clear of the bite.

Given a thoroughly well-constructed bridge, what would be the probable condition of things in ten or twenty years? How much can we promise our patient, with the experience we have of this work, so far? It is largely a question of mechanical skill *versus* surgical experience."

Gum Acacia in Use with Plaster.

The addition of gum acacia to plaster, when used either for casting models or taking impressions, is advocated by Mr. E. Lloyd-Williams. When the plaster is used for the purpose of obtaining an impression, he adds one ounce of mucilago acacia (B.P.) to a pint of alum solution; when, however, the plaster is used for casting models slightly less is required. The addition of the gum acacia is said to render the plaster less pliable and more dense, and gives it at the same time a silky look.—*Jour. Brit. Association.*

A Hint About Articulation.

Dr. B. F. Eshelman writes to the *Dental Review* as follows:

"I have found that to blacken the surface of a strip of writing paper with a lead pencil affords a ready and efficient substitute for carbon paper when necessary to grind a crown or denture in the mouth. "Drag" the paper slightly when closing."

Luxation, or the Immediate Method in the Treatment of Irregular Teeth.

Dr. George Cunningham in an interesting article in the *Dental Record* gives his method of performing this operation, as follows:

"All the teeth should be thoroughly scaled, cavities filled and an alcoholic saccharin wash used several times a day before operation.

On day of operation. Brushing the teeth and bathing them with saccharin wash—better with H_2O_2 than H_2O for dilution—same wash after the operation and frequently next few days.

It is well except in the simplest cases to have studied a model, making the re-arrangement of the teeth on a duplicate model. If a splint can be prepared from this ready for use immediately after the operation, so much the better.

All being ready, cut the alveolus with a thin circular saw, $\frac{7}{8}$ inch to $1\frac{1}{4}$ inch in diameter, not thicker than thin note paper, into such sections as are necessary. This is quickly done, and can be borne quite frequently without any anæsthetic. Forceps, elevator or other instrument is used for pushing, pulling or rotating the tooth sections into place. Forceps should have the beaks guarded. I use copper sheaths moulded and soldered so as to fit the beaks fairly tight. Rubber sheaths, soft or hard, will also do. Dr. Bryan's special forceps with curved support for bringing a tooth inside the arch into line seems well adapted for this purpose. In moving teeth backward or rotating teeth out of line into the arch is much facilitated when a badly carious neighboring tooth must be extracted. This extraction may be done at the time, but possibly better two days or so previously, as the local post-operative inflammation facilitates the bending and movements of the alveolus. In such cases the sectionizing of the tooth and its alveolus may be done with a pair of surgical bone cutters, or even with Physick's wisdom teeth forceps. The wedge-shaped beaks of the latter are extremely useful when it is necessary to push the teeth backwards. The movement of the tooth or teeth into the desired position may be very easy, but often requires great strength carefully applied. One to six teeth have been so moved. The chief point in the operation is to move each tooth with its socket entire as far as that may be possible.

The teeth when in position should be ligated with silk or thin silvered steel wire, preferably the latter, or fixed in a splint. Thin German silver or platinum bands soldered together make a good splint.

Care must be taken in closing the teeth, as the articulation is almost certain to require adjustment by diskling, etc. Carborundum wheels work quickest.

When finished, syringe thoroughly with peroxid, saccharin wash, especially any pockets or spaces marking the previous position of the moved teeth. Paint all the bleeding or cut surfaces with Richardson's styptic colloid. To a saturated solution of tannic acid in alcohol and ether (equal parts) pyroxylin (gun cotton) is added as the liquid will dissolve (tannin collodion preparation). The pain has usually subsided by this time and the patient feels fairly comfortable. The patient should be seen next day in case the teeth have moved—syndring, styptic and cleansing, as before. If possible, continue this treatment for next few days, the patient always using the wash after meals. In a few cases new ligatures may be unnecessary, ligatures should be renewed or dispensed with as required by the indications. A period of three or four weeks is usually ample time for retention by ligatures or splints.

Replantation.

In an article on this subject in the *Journal of the British Dental Association*, Dr. F. Harrison in speaking of the preparation of the tooth for replantation, says :

“ I advocate the removal of a portion of the apex of the root because I imagine that the alveolus in healing, will, as all other cavities do, heal by granulating from the bottom, and in that case especially as the teeth have been allowed to remain out of their sockets for some time, we must expect that at the bottom of the crypt there will be the most resistance to the introduction of the replanted tooth, and this must necessarily be allowed for, or otherwise when re-instated will have a tendency to be pushed out by the elasticity of the granulations, and so make the tooth appear when fixed to be longer than desired. The slight contraction of the side, as well as the base of the alveolus, form an ideal splint, and I feel that I should not have much hesitation in treating a case without what one might term a secondary splint, especially if there has been a simple dislocation of the tooth, and no great fracture of the alveolar wall.”

Malocclusion.

In an article on this subject in the *Dental Review*, Dr. W. H. H. Barker states :

“ Malocclusion does not allow of either normality or healthfulness in the teeth, either as a unit, or as an aggregation ; work is their life, and antagonism their salvation. In malocclusion, both, to some extent are

wanting, their office abrogated, and they must pay the penalty. Disease readily attacks a single member of the arch, or the whole of that arch, if not put to service, and the role of nature, is to expunge what is of no service in her economy. Among the many causes of malocclusion, may be noted the following, viz.: Irregularity, a most fruitful source, happily in a large number of cases, remedial. It is seen in its worst form in a crowded condition, and is the result of a want of correspondence in the size of the teeth and jaws. Then comes the lack of the proper number, and results usually, from loss of caries, or extraction after the organ has developed and taken its place in the arch. Next the wasting of the gums and alveolar processes from mercurial salivation, pyorrhœa alveolaris, the impingement of salivary and sanguinary calculus, and other diseases, causing the teeth to change their positions, and to assume new ones, not in keeping with the use for which they were designed, or intended in mastication.

Besides these, there are numberless others, such as abrasion mechanical and chemical, erosion, atrophy, hypertrophy and exostosis, aside from numerous diseases that attack the antrum of Highmore, and the soft tissues covering and adjacent to both maxillaries, as inflammations, abscesses, tumors and cancerous growths. Traumatic wounds, or mechanical injuries inflicted by accident or caused inadvertently by those who operate on these parts in the oral cavity are also to be noted.

It may not be within the power of the dentist or surgeon to at all times prevent the evils of malocclusion, or remedy them after they once occur, but certainly it is within their power to put forth their hands to stay the deadly work of the forceps, and refuse to mar, where the hand of science might justly step in, build up and repair.

It is certainly within their legitimate field to strive to keep intact that which they can never repair, when once the despoiling hand has done its work.

Bearing in mind the ill that follows in the wake of every dental lesion, it should be their aim to conserve and protect, and thus render nugatory, at least to some degree, the dire effects of malocclusion."

Local Anesthetics.

In an editorial in the *Dental Headlight* we read: "The careless manner in which this drug (cocain) has been used by the medical and dental professions can be attributed only to ignorance of its deadly character. It has been extolled until the public has come to believe that it is harmless, or nearly so. Almost every journal one reads contains someone's

formula for a local anesthetic of which cocain is the basis, with which the originator can rob the operation of extraction entirely of pain, the claim based upon a few trials after a few weeks' use, and without specific directions as to the amount to be used, or making any allowance for differences of age, sex, or constitutional susceptibility.

The knowledge of the agent gained by experiments on the lower order of animals at one time it was thought promised to establish it as safe and reliable; but when these experiments were repeated upon the human subject, they resulted frequently in the manifestation of the most alarming symptoms, and occasionally in death.

The amount of cocain now used for the extraction of teeth, as compared to a few years past, except that employed by the professional tooth extractor, is almost none.

We must look for applications for the relief of pain among those agents possessing local anesthetic properties of known harmless character. Try the one given below: Do not allow the patient to swallow the mixture, as menthol when swallowed causes nausea.

R	Menthol	-	-	-	-	-	-	-	gr. 160.
	Tr. Myrrh	-	-	-	-	-	-	-	m. 80.
	Alcohol	-	-	-	-	-	-	-	$\frac{3}{4}$ ij.

S. Thoroughly dry the gums and apply freely for a few minutes. Use more freely for a permanent than a deciduous tooth."

Glass Inlay Work.

Regarding this work, G. J. Wardell says in the *Dental Record*: "A great saving of time and disappointment is effected by having a good space between teeth in the case of approximal cavities, and by seeing the gum well clear of the cervical edge of cavity.

In preparing the cavity the walls should be made as square downwards as practicable, to allow of the inlay being plug-shaped, thus reducing the liability to chip the edges, and giving room for roughening. To effect this one has sometimes to line the cavity with osteo and cut to shape afterwards.

In making the matrix, the foil should be large enough to be held in position with the finger and thumb, and it should not be allowed to move until quite finished, unless there is necessity for annealing, which is seldom the case; push the foil into the cavity with a square of amadou, and, leaving the amadou in, burnish the foil round the edges of the cavity with a ball-ended filler, after, of course, seeing there is no trace of mercury around, or the whole thing will collapse in firing.

One of the most aggravating tendencies of the whole process is the flying out, or lifting up, of the material in the first drying; this is entirely obviated by mixing the first layer of glass powder with a solution of gum tragacanth. If, from too sudden heating up in the second or third firing—in large inlays—the glass cracks across the middle, throw it away, the matrix is distorted.

Always make some undercut in your inlay with a knife-edge corundum disk. They are supplied fine enough for this purpose. When cementing in, the inlay must be tied down, draw a piece of gilling twine, or ligature silk, once or twice across a stick of Model cement—obtainable at the Dental Manufacturing Company at the rate of twopence a stick—take a single turn round the tooth over the middle of inlay and pull tight; if much contour on tooth melt a little of the cement on it before putting on the string, it will then stick easily. Finally the whole should be covered up. String, and inlay with the Model cement run off a warm spatula. (I always use the above cement for covering osteo fillings in preference to mastic or wax). With careful attention to detail I have found glass inlay work to be eminently satisfactory."

Contour Fillings.

T. J. Huntington says in the *British Journal of Dental Science* :—

"The first requisite of contour filling is plenty of space in which to work. While there is much difference of opinion as to how much cutting away should be done in the preparation of cavities, the best plan is to pretty freely cut away all frail portions, or portions which, unless cut away, will, when the cavity is filled, bring the line between filling and enamel in contact, when the filling is finished, with the neighboring tooth. The sacrifice of enamel and dentine sometimes seems unnecessary, but more failures come from the lack of free cutting than from the opposite. If there was more cutting away of the lateral margins of approximal cavities at the crevices of teeth, there would be less fault found with the efficiency of filling materials.

An Electric Water Heater.

Dr. T. J. Hill sends the following communication to the *Pacific Stomatological Gazette*:

"A very convenient way of heating water by any one using electricity for lights, motor-power, etc., is to procure an electric-light globe,

put a small tap in the pointed end and firmly fix it to a wall-bracket; arrange to have a 16 C. P. bulb go inside of this. The water is put between the bulb and globe. By using a red light it makes an ornamental as well as useful water-heater. We have, also, a small electric stove for a gutta-percha heater, warming instruments and annealing gold. Both are home-made, and can be gotten up at a trifling expense."

Just what the Profession Needs.

Conciseness in dental literature is what the busy dentist appreciates. This is what the OHIO DENTAL JOURNAL is striving to maintain as observation of these pages will verify. Regarding this subject, Dr. J. E. Line, in an editorial in the *Odontographic Journal*, says:—

"In the course of a plea for succinctness in scientific papers, the editor of the *Pacific Druggist and Physician* shows to what degree condensation may be carried, by reducing to a paragraph of six lines all of value contained in an article of forty-nine, or one-half the space of this exchange's generous page. But if everything offered for publication, and most of which is published, were thus "succincted," what would become of the "original communication" department of our periodicals,—dental periodicals for example. The simple fact of the matter is that it is much easier to write long than short, diffusely than concisely; to bury a thought than vivify it."

Impacted Third Molars.

In an article published in the *International Dental Journal*, Dr. J. W. Foreman, says:—

"From my observation and experience I can conceive of no case, where the tooth is through the gum at all, or even above the edge of its socket, in which it would be anything but *bad* practice to extract the second molar, except where inflammation is so great that it would be dangerous to delay extraction long enough to bring the offending tooth up within the grasp of the forceps, or the possible case where there might not be strength enough in the tooth to resist the force necessary to dislodge it. Should the tooth present horizontally, or be so imperfectly erupted as to be beyond the reach of the forceps, an apparatus to elevate it is needed.

The appliance used in dealing with the last case is a vulcanite cap to cover the two molars and second bicuspid, with a gold arm bent so as to project over the tooth to be lifted, and as far above it as the upper jaw

will permit. The remainder of the apparatus consisted of a gold-wire staple with the ends bent the second time so as to form an enclosed long link, the ends of which were pinched together into holes drilled in the buccal and lingual sides of the tooth, and a piece of rubber tubing to connect this staple with the projecting arm of the cap.

The idea was first to get the force from a screw, but it was found that the patient could not manage that, and the elastic was substituted. The cap was removed, cleaned, and replaced once a day by the patient.

This tooth was placed horizontally, the grinding surface impinging upon the distal root of the second molar; the distal surface, the only part uncovered, less than one-fourth of the circumference of the tooth. The gum had to be cut away on both sides to get low enough down to drill the holes, the discolored part between the holes being all that was exposed.

Ten days sufficed to lift the tooth enough to permit fairly easy extraction. A severe otalgia, from which the patient had suffered for weeks, disappeared almost as soon as the tooth began to move, and, with the exception of a slight attack the day after extraction, has never returned."

Removal of Blood Stains.

The best way to remove blood stains, says the *Zentralblatt f. Gyn.*, is to soak the towels, etc., in warm water to which a teaspoonful of tartaric acid has been added. No soap is needed.

To Remove Green Stain.

Dr. T. C. Gramm gives the following method for removal of green stain from the teeth:

"I use three per cent. pyrozone or hydrozone with pumice-stone upon a rubber disk or polishing-cup. Green-stain may generally be easily removed with that means. In obstinate cases, instead of removing the cuticle with powdered pumice-stone, I would prefer to apply, for a few minutes, a ten per cent. solution of hydrochloric acid, which is but faintly acid, and remove the cuticle at once, green stain and all. This to be followed with an alkaline wash, and a thorough polishing of the enamel with chalk."—*Cosmos*.

Simple Method of Refitting Plates.

Dr. J. R. Pugin gives his method in the *Dental Digest*, as follows:

"Take impression and make the cast in the usual manner. Set the

old plate on the cast. It will fit sufficiently well to give proper antagonism of the teeth in the finished case. If there are any marked undercuts, cut off rubber on old plate so that it can be placed on cast accurately without marring same. Remove the teeth from the plate carefully. This can be accomplished without springing the plate, by heating the teeth one at a time and gradually in the flame of a spirit-lamp. There is no necessity for checking the teeth. Now with a file or engine bur cut away that portion of the rubber which immediately surrounded the pins. Then set the teeth back on the rubber in their original position, and replace with wax the portion of rubber cut away. Try it in if you desire. Invest in the usual way, separate and remove wax and old rubber, and pack entirely with new rubber.

I follow this method in repairing plates that have been badly broken. If the plate fits well do not take a new impression, but let the old plate answer that purpose. Always remove all the old rubber, for it just as easy to remove all as part of it, and the work is certainly more artistic and substantial and more satisfactory to both patient and dentist."

EDITOR'S NOTES.

The Ohio Dental Journal.

WITH this issue we close the fifteenth volume of the OHIO DENTAL JOURNAL, and wish to sincerely thank our subscribers for the support they have given us. What the JOURNAL has been in the past, you already know; what it will be in future, remains to be seen. In a general way we may state that we propose to furnish our readers just the best dental journal possible; and no expense or labor shall stand in the way of attaining this end.

The coming year the JOURNAL will be made up similar to this issue; all society papers thoroughly condensed, and, in fact, all material presented in as concise a manner as possible without destroying any of its goodness. Flowery language and verbose descriptions have their place in literature, but that place is not in a dental journal to be read by busy dentists. They are after useful information and want to have it appear in the most condensed form possible. This we shall keep in mind at all times. We expect to give our readers the benefit of a series of articles, during the coming year, on "Up-to-Date Dentistry," written by some of the most noted men in the profession. The first of this series will be an illustrated article on "Up-to-Date Bridge-work," by

Dr. E. Pärmy Brown, and will appear in the January issue. We shall from time to time add new features to the JOURNAL as they appear to us and we think they will prove beneficial. Our aim shall be to supply our readers with everything good, and we trust that we shall receive such hearty support from subscribers as we have enjoyed in the past.

May 1896 be a prosperous and happy year for all.

New Publications.

MEDICAL MICROSCOPY.—A GUIDE TO THE USE OF THE MICROSCOPE IN MEDICAL PRACTICE. By Frank J. Wethered, M.D. (Lond.), member of the Royal College of Physicians, etc. Philadelphia: P. Blakiston, Son & Co., Pub. Price, cloth, \$2.00.

Altogether this is the best work on this subject that we have yet seen. It leaves little to be desired.

The first chapter treats of the microscope and accessories, giving valuable suggestions regarding the selection of a microscope, microtome, etc. Methods of hardening and decalcifying tissues is then taken up, and this is followed by methods of embedding and cutting sections; staining; clearing and mounting; complete processes for the preparation of sections; method of preparing sections of the central nervous system; injection of tissues; preparation of individual tissues and organs; the examination of tumors; examination of urinary deposits; feces; sputum; the micro organisms of sputum; examination of vomit; discharge and contents of cavities; discharges from genital organs; examination of blood, food and water; cutaneous parasites; bacteriological methods, etc.

The text is well written and covers 401 pages, and the illustrations number more than one hundred. The practitioner and student who work with the microscope should possess a copy of this work.

A COURSE OF ELEMENTARY PRACTICAL BACTERIOLOGY, INCLUDING BACTERIOLOGICAL ANALYSIS AND CHEMISTRY. By A. A. Kantback, M.D., M.R.C.P. and J. H. Drysdale, M.B., M.R.C.P., London and New York: Macmillan & Co., Pub., 1895. pp. 181. Price, cloth, \$1.10.

This little manual has been gotten up for a laboratory handbook. It is entirely practical and just what the student needs as a working guide. It is divided into three parts. The first part treats of bacteriology proper; the second part takes up bacteriological analysis; and part third treats of bacteriological chemistry.

The matter is thoroughly condensed and so concisely arranged that the whole field of practical bacteriology is well covered. It is a work that will aid the general practitioner as well as student and we heartily recommend it to the bacteriologist.

Obituary.

DR. JAMES E. GARRETSON.

DR. JAMES E. GARRETSON died of enteritis, at his home near Philadelphia, on Sunday, October 27th, 1895. He was born in Wilmington, Del., October, 1828. He began the study of dentistry when quite young and graduated from the Philadelphia College of Dental Surgery in 1856. He entered the Medical department of the University of Pennsylvania, from which he graduated in 1859. He was for several years associated with Dr. D. Hayes Agnew in the Philadelphia School of Anatomy as assistant, and in 1862, was selected to fill the position made vacant by the resignation of Prof. Agnew. In 1864 he gave up this position and entered the Philadelphia Dental College as professor of anatomy and surgery. In 1869 he was appointed oral surgeon to the hospital of the University of Pennsylvania. In 1880 he was elected dean of the Philadelphia Dental College, which position he held until his death. Aside from his "System of Oral Surgery" and his numerous contributions to dental periodicals, he was the author of the following works: "Brushland," "Hours with John Darby," "Thinking and Thinkers," "Odd Hours of a Physician," "Nineteenth Century Sense," and "Man and His World." These were written under the *nom de plume* of "John Darby." He stood without a peer as an oral surgeon and was the first to make use of the dento-surgical engine in surgical operations.

He was a man of superior education; affable, kind, generous, and unsuspecting in his nature; loved by all who knew him. A wife, two daughters, and a host of friends mourn his loss.

DR. W. H. SEDGWICK, SR.

DR. W. H. SEDGWICK, SR., died of kidney disease, at his residence, Granville, O., on October 24th, 1895. He was born at Rockhill, O., in 1833. In 1848 he entered the dental office of his father and practiced dentistry continuously from that time until his death. In 1869 he graduated in dentistry from the Ohio Dental College, Cincinnati, of which he was one of the founders and trustees. The deceased stood high in Masonic circles, being an active and honored Past Master, and District Lecturer of the Grand Lodge of Ohio. He was also a member of the Knights of Pythias and Order of Eastern Star. He was an earnest advocate of the importance of the public school, to the elevation of which he gave his voice and influence, which are largely responsible for the excellence of the township schools to-day. As a dentist he stood high in the profession and will be greatly missed. He was a man of excellent judgment, always taking the side of right. A man of sterling character, always ready to assist in any undertaking that would promote the interests of dentistry.

A wife, two daughters, one son, two sisters and a brother survive him. To these his death is a grievous loss, especially since the family relations were so tender and affectionate. For their suffering the entire community feels a deep sympathy and joins them in regret over the death of a kind father and husband, a worthy citizen, a faithful friend and a resident loyal to the best interests of his section.

Southern Dental Association.

At the twenty-sixth annual meeting of this society, held at Atlanta, Ga., November 5th to 8th, 1895, the following officers were elected for the ensuing year:

J. S. Thompson, Atlanta, president; L. P. Dotterer, Charleston, S. C., first vice-president; W. E. Walker, Pass Christian, Miss., second vice-president; T. C. West, Natchez, Miss., third vice-president; E. P. Beadles, Danville, Va., corresponding secretary; S. W. Foster, Atlanta, Ga., recording secretary; H. A. Lowrance, Athens, Ga., treasurer.

Next place of meeting will be Nashville, Tenn., second Tuesday in November, 1896.

